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DETERMINISM AND INDETERMINISM IN CLASSICAL PHYSICS

BY V. F. LENZEN

The physical world is a manifold of characteristic things and processes connected by various relations. The problem of this symposium is to discuss certain aspects of physical relatedness, in particular, the question of determinism or indeterminism in physical phenomena. I propose to investigate this problem in classical physics. By classical physics I mean the physics based on the concepts which were fashioned in the seventeenth century by the work of Galileo, Newton, Hughens, and others, and which furnished the conceptual instruments of investigation until the advent of the quantum theory.

Let us first describe in general terms the subject matter of physics and the different types of theory which arise from a natural classification. Planck has formulated the criterion that the real for physics is that which can be measured. Accordingly, we shall mean by physical reality measurable objects and phenomena in space and time. Our fundamental classification of physical theories depends upon whether the measurable reality is given or not. We shall distinguish between a physics of the given and a physics of the non-given.

Before developing this distinction in detail I wish to explain in what sense a thing or process may be said to be given. This is advisable in view of the fact that it is possible to argue that all physical objects which are assumed to have an individuality and permanence extending beyond the momentary perception are not given but are constructions. It is not my purpose, however, to carry the analysis that far. An object, even though it be an intellectual construction, will be said to be given if the elements of the construction can be directly given in sensible experience. Thus a cylinder rolling down an inclined plane is a physical object which may be given in perception. On the other hand, an electron in a hypothetical orbit of an atom is not given. The distinction between the given and that which is not given is one between things having characters which are directly accessible to sensible experience and those not having such characters. There still remains the problem of the ground of the self-identity of things during the flux of sensible changes.

A natural classification of physical theories is based upon the distinction between given and non-given processes, between large-scale and fine-scale processes. I therefore introduce the division of physics into phenomenological and atomistic physics, into macroscopic and microscopic physics. A macroscopic physics deals with given, that is, directly measurable, large-scale things and processes. Thus classical mechanics, which is the science of the motions of observable bodies, is macroscopic physics. The concepts and laws of classical mechanics were fashioned to describe the motion of bodies rolling down an inclined plane, the collisions of elastic bodies, the motion of a pendulum, the motions of the heavenly bodies, etc. Again the science of thermodynamics, which deals with the relation between heat and other types of energy, is a macroscopic theory. Its fundamental quantities, such as temperature, volume, pressure, electromotive force, energy, entropy, are directly measurable or are defined in terms of directly measurable quantities. Observable phenomena were the first object of physical investigation and classical concepts and laws were constructed with a view to the representation of directly observable phenomena. In particular, the classical mechanics was the first branch of physics to be systematically developed and this circumstance largely determined the program of classical physics. Other phenomena were considered to be explained only in so far as they were analyzed into mechanical processes.

In addition to macroscopic physics there also arose in classical physics microscopic theories. An example of a microscopic theory is the kinetic theory of gases. According to this theory a gas is composed of many discrete moving particles. The observable properties of gases are derived from the mechanical properties of a large number of molecules which are in rapid motion and collide with each other and the walls of the containing vessel. The motions of the particles are determined by the laws that have been found to hold for macroscopic mechanical phenomena.

Thus both in macroscopic and microscopic physics the fundamental concepts and laws were derived from macroscopic phenomena. As I have already stated, the classical concepts were derived principally from classical mechanics. It is therefore appropriate to study the problem of determinism and indeterminism in classical physics in classical mechanics. The classical mechanics is rigorously based upon the principle that the sequence of mechanical phenomena is precisely determined. Let us consider the form to be given to the principle of determinism.

The original expression of the principle of determinism was the law of causality. Kant's formula is, "Everything that happens (begins to be) presupposed something, upon which it follows according to some rule." A well-known example of causal connection is that in which there is a collision between two moving billiard balls. To quote Hume, "Motion in one body is regarded upon impulse as the cause of motion in another". In recent theory the concept of causality has been expressed as a functional relationship. Now a functional relation holds between numbers. But physical properties are represented in knowledge by numbers which express the measures of the properties in terms of certain units. The principle of determinism is then expressed by the proposition that there exists a functional relation between physical measures. The nature of the functional relation may be illustrated by the example of the collision of two billiard balls.

Let m_1 and m_2 be the masses, v_1 and v_2 the instantaneous velocities and E the total energy. During impact the motion is determined by the equations

$$m_1 \frac{dv_1}{dt} = -m_2 \frac{dv_2}{dt}$$

$$\frac{dE}{dt}=0$$

These are differential equations which correlate, first, the instantaneous rates of change of the velocities of the two balls and, second, express the instantaneous rate of change of the total energy. Such differential equations exemplify the characteristic form of physical laws. From the differential equations it is possible to obtain equations between finite quantities by the process of integration, upon the assumption of the invariability of the law during a finite interval of time. We then get

$$m_1v_1 + m_2m_2 = constant.$$
$$E = constant.$$

These functions which are constants are called integrals of the motion. Thus in a motion involving the impact of elastic spheres the differential equations have the integrals of momentum and of energy. The momentum and energy are equal before and after impact. For given masses the foregoing equations determine the velocities after impact as functions of the velocities before impact. This is the exact form of the statement that the motion before impact is the cause of the motion after impact.

In mathematical physics the differential equation is the fundamental form of physical laws. It is the proper mode of representation of continuously varying processes. The integral forms require the assumption that the differential equation holds during the time and throughout the region in which the process is represented as taking place. It is the integral form which is compared with experience.

In general terms, the motion of a mechanical system is determined by a set of differential equations. These equations have solutions by which the coordinates are expressed as functions of the time and certain arbitrary constants which can be determined if the configuration and state of motion of the system is known at a given time. Thus if the configuration and state of motion of the system is known at some given time it can be calculated for any future or past time. This is the expression of the principle of determinism in mechanics.

But this kind of determinism also expresses the classical principle of causality. The temporal aspect of the causal process is expressed by the fact that time is the independent variable in the differential equation. Hume has emphasized the contiguity of cause and effect. This, in effect, means that causation is continuous. Determination through differential equations is an expression of the continuity of physical processes.

M. Meyerson, however, rejects the view that the principle of determinism expresses that of causality. He has distinguished between *légalité,* that is, conformity to law, and causality. In his opinion the concept of causality implies the notion of self-identity during the causal process, for an aspect of causal connection is that cause equals effect. But we have seen that the integration of the equations of motion results in integrals, that is, constants of the motion. In the collision of two elastic spheres the total momentum and energy are constant. If a moving billiard ball strikes an equal ball at rest, the first one comes to rest and the second moves off with the momentum and energy possessed by the first one. This deduction from the equations of the motion agrees with the principle that the effect equals the cause. To my mind, the self-identity which Myerson finds in causality is a characteristic of processes determined by differential equations. Thus conformity to law implies causality.

The differential equations of mechanics have furnished the pattern for determinism in physics. These equations have the special character of being differential equations of the second order. In virtue of this property the equations are satisfied if in the solution minus t is substituted for the time. This means that if a given motion is possible the reverse motion is also possible, that is, mechanical processes are reversible. Thus, if after the collision of two billiard balls they be given velocities equal and opposite to those possessed at a given instant, the reverse motion will occur, the balls will collide and acquire velocities equal and opposite to the initial velocities in the first instance. The same equations determine the reverse process.

But there also exist in nature irreversible processes. Suppose two bodies at different temperatures are placed in contact. Heat then flows of itself from the body at the higher temperature to that at the lower temperature. But the reverse process does not occur. Thermal phenomena are characterized by irreversibility. There appears to be a dualism between the reversible processes of mechanics and the irreversible processes of thermal phenomena.

This dualism holds only in the macroscopic realm. In classical physics the principles governing irreversible thermal phenomena were derived from those of reversible mechanical processes by the construction of a microscopic theory for heat phenomena. According to this theory heat consists of the energy of random movements of the molecules which constitute bodies. This microscopic theory made possible a more inclusive system. But there arises the problem of determinism or indeterminism in the microscopic world.

We have already seen that classical macroscopic physics originally presupposed a strict determinism. The question now presents itself:—What is the status of determinism and indeterminism in classical microscopic physics? By definition microscopic processes are not given in perception. Hence there is at the outset a problem as to the origin and nature of the concepts and principles to be employed in constructing a microscopic theory. In classical physics the method has been to extend the concepts and laws of macroscopic physics to the fine-scale elementary processes. Thus in kinetic theory the molecules have been viewed as elastic spheres, the collisions of which are determined in accordance with the laws of conservation of momentum and of energy. So the rigid determinism expressed by the differential equations of classical mechanics has been extended to the microscopic realm. There is the further question of the ground of validity of the assumptions of microscopic physics. Direct observation is closed as a method of verification; one must have recourse to the verification of deductions from assumptions. Macroscopic quantities are interpreted in terms of the average values of many microscopic quantities and the verification of the initial assumptions is achieved by deriving observable relations.

The microscopic kinetic-molecular theory of matter has made it possible to analyze thermal phenomena into elementary mechanical processes. Thereby irreversible processes have been reduced to reversible processes. But careful analysis of this result seemed to reveal a logical contradiction in mechanics. It seemed self-contradictory that irreversible processes could be grounded in reversible elementary processes.

The removal of this contradiction has been the purpose of the introduction of the concept of statistical law into physics. By a statistical law I shall mean the statement of a functional relation which is found to hold in a large proportion of the instances observed. The laws of elementary processes are viewed as strictly determined. This has been clearly stated by Jeans;—"Whatever laws or systems of equation govern the motion of the system, we must suppose some definite law of causation to hold—this is a necessary condition for the problem being capable of discussion at all. A system of particles endowed with free-will would not be a fit subject for mathematical treatment." In classical microscopic theory the differential equations which express this determinism are of the type which describe reversible mechanical processes.

The individual elementary processes can not be observed or predicted mathematically. However, statistical information is obtainable. For example in the case of a gas one can determine the average fraction of the molecules which have velocities within a defined interval. Such statistical behavior determines the average effect of many elementary processes. But macroscopic quantities are defined to be the average effects of countless varying elementary quantities. The observed regularities in macroscopic phenomena are the relations between these average effects. The statistical behavior of the elementary processes under given external conditions is for all practical purposes a constant, from which it follows that the same macroscopic processes are reproducible under the same external conditions. But, since the macroscopic process is based upon average statistical behavior, there is always a probability that appreciable deviations from the average will occur. Thus macroscopic laws are subject to fluctuations.

In classical physics, therefore, we have two types of regularity, fundamental and derived, causal and statistical, invariable and probable, microscopic and macroscopic. There is determinism in the microscopic world and indeterminism in the macroscopic world. To be sure, the indeterminism is practically negligible, but theoretically it is necessary to preserve the self-consistency of classical physics. The concept of determinism which was fashioned in classical macroscopic physics is, rigorously interpreted, applicable only in the microscopic realm.

I have left to Professor Williams the task of expounding the quantum microscopic physics. But I may be allowed to point out its essential trait: the quantum theory introduces an indeterminism in microscopic processes.

THE MYSTIC VEIL

BY JOHN RICHARD MORELAND

Between the unknown and the things we know
There hangs a silver veil of mystery,
And science daily toils that it may be
Master of secrets that so strangely blow
Down fleeting years . . . those forms as white as snow . . .
Of life and death. Faith waits on bended knee
And doubt strains its dark eyes that it may see
Beyond the silence where our footsteps go.

I think the mystic curtain's wearing thin
That separates the unknown from the known,
And now and then a breath of truth is blown
Through the worn veil, which, should we tear aside,
Time will dissolve and like a mighty tide,
God . . . and eternity . . . come rushing in!

DETERMINISM AND INDETERMINISM IN QUANTUM PHYSICS

BY W. H. WILLIAMS

Determinism is a philosophical term. If at the outset I confess to you that I am not at all sure what it means you will deplore my presumption in making it the subject of discourse to a group of philosophers. My excuse is that I have no thesis to establish. Rather, it is my task to set forth as clearly as I can the present state of theoretical physics; and it is then for you to say whether or not it is deterministic.

Recently, in reading a criticism by Lord Acton of Buckle's History of Civilization I came across the following definition of Science: "Science is the combination of a great mass of similar facts into the unity of a generalization, a principle or a law, which principle or law will enable us to predict with certainty the recurrence of like events under given conditions." I am not sure that a mid-Victorian physicist would have quarreled seriously with this definition. It fits fairly well the point of view of the older physics which my colleague, Professor Lenzen, has described so clearly. But certainly the present day theoretical physicist would tolerate no such *a priori* limitation upon the nature of his generalizations as that implied in the words "predict with certainty." The physicist will be glad to predict with certainty if he can, but if it turns out that he cannot it by no means follows that there is no science of physics.

What then is the *sine quâ non* of physics as a science? As I see it physics is essentially quantitative, which means that its laws are expressed in the form of mathematical equations, the numbers appearing in these equations being the results of measurement. Now mathematics is the science of order, and the mathematical expression of physical laws implies that there is some sort of order in Nature. If Nature were purely chaotic there could, I think, be no physics. But between pure chaos and a strictly deterministic universe there is room for a lot of things to happen which can interest the physicist. One is tempted to say that there is even room for free-will.

Granted then that physics must presuppose some kind of order in Nature, it would seem that the least and perhaps the most a physicist can demand of his laws is this: if he chooses a limited portion of the external world and makes upon this "system" a set of measurements at two different times, his first set of measurements entered into the equations which express the laws will give him some advance information concerning the second set. It would further seem that this advance information can be of two kinds and only two. The first kind of advance information or prediction is exemplified by the statement that if you drop a ball from the leaning tower of Pisa it will strike the ground exactly 3½ seconds later. An example of the second kind of prediction is the statement that if one throws a pair of dice the chance of casting two aces is 1/36. The first kind of prediction is deterministic; the second kind involves an element of uncertainty, but the uncertainty or indeterminism is a qualified one. In the two examples given, one statement is quite as mathematical as the other and both imply order in the phenomena in question.

It has long been known that some of our physical laws are statements of the second, that is the indeterministic or probability kind. Willard Gibbs pointed out that laws such as "Nature abhors a vacuum", "Water seeks its level", "Heat flows from the hotter to the colder body" are of this sort. Nature is not always vacuophobic, water may flow uphill. A true statement of such laws, "It is highly probable that if you pick up a red-hot coal you will burn your fingers; it is possible but highly improbable that you will freeze them." On the scale we human beings happen to be built the probability is so high as to be practical certainty; but to a race of intelligent microbes the law that Nature abhors a vacuum would be about as exact as the rule that gentlemen prefer blondes. It is to be noted, however, that this indeterminism is secondary and not fundamental. It is consistent with and is indeed explained by the fact that the molecules of which gross matter is composed themselves obey the laws of classical mechanics. And the laws of mechanics are purely deterministic. The only trouble is that they are not true.

There is not time to trace the amazing advance of atomic physics during the last twenty-five years. Quite early in this development it was realized that classical mechanics could not explain the facts, but not until three years ago was a beginning made at the formulation of the true mechanics. Progress since then has been rapid and we now have a set of equations whose validity seems secure. The new equations, although formally resembling the old, give us a very different sort of information. Stating the case somewhat crudely and inexactly, one may say that the old equations told us, for instance, that if you shoot a billiard ball against a perfectly elastic cushion at an angle of 45 degrees it will rebound at an angle of 45 degrees on the other side of the perpendicular. The new laws, on the other hand, tell us that if you shoot an electron against a smooth surface it will probably rebound at an angle somewhere near its angle of incidence but it is possible for it to rebound at any angle. The probabilities of various angles are accurately determined. It is not to be understood that there is one mechanics for the billiard ball and another for the electron. The probabilities depend upon the mass of the particle and the billiard ball is so many billion times heavier than the electron that the probability of rebound at 45 degrees turns out to be very nearly certainty. But the element of indeterminism is just as surely present.

This then is the state of affairs. Now it may be admitted that there was something pleasing in the old clean-cut deterministic mechanics and that the entrance of uncertainty into our fundamental equations brings a trace of mental dissatisfaction. If one chooses to get emotional about it, one may seek a way out by invoking a still lower-scale and more ultimate determinism out of which might conceivably flow the uncertainty in atomic phenomena. Whether such speculation is of interest to the philosopher I do not know. To the physicist it is futile and meaningless, since there is no evidence whatever that an electron is an aggregate of still smaller particles.

But now I must tell you that the matter is by no means as simple as I have stated it. A deeper analysis of the situation brings up a number of questions. The difference between the old and the new mechanics may be put in another way. Suppose one knows the state of an isolated mechanical system at one o'clock today, then the old mechanics says that its state at two o'clock is completely determined; the new mechanics, on the other hand, determines only the probability that its state at two o'clock will be such and such. But what does one mean by the state of a system at a given time? In classical mechanics it meant the position and velocity of all the particles of the system. But Heisenberg, the discoverer of the new quantum mechanics, has pointed out that we cannot simultaneously measure the position and the velocity of a particle. The more accurately one determines its position the less accurately is its velocity determined, and *vice versa*. Of course the measurements of physics are finally referred to sense impressions and partake of the indefiniteness of these, but what is meant here is something more fundamental and less anthropomorphic than that. Imagine an ideal observer with perfect sensory apparatus and give him an ideal microscope with which he could actually see or photograph an electron. Then the precision with which he could locate it would depend upon the wave length of the light by which it is illuminated; the smaller the wave length the greater the accuracy. (This principle is actually used in viewing very minute objects with a microscope.) But an electron cannot emit nor reflect light without undergoing an *abrupt* and *discontinuous* change in its velocity and the shorter the wave length the greater the velocity change. This *discontinuity* in atomic processes is the very essence of the quantum theory. So the very act of observation of a particle's position precludes the assignment to it of a definite velocity. Has an electron at the same time a definite position and velocity? One is tempted to answer that in the very nature of things it must have. But physicists have learned to be suspicious of concepts which are not subject to measurement ever since Einstein taught us that the notion of the absolute simultaneity of events at different places is illusory. However, if one is willing to stop a little short of exact determination, then it is possible to determine for an electron two very small ranges within one of which its position lies at a given instant and within the other its velocity. One can narrow one of these ranges only at the expense of broadening the other. Their product is inversely proportional to the mass of the particle.

Taking account of this Heisenberg uncertainty factor, one can say that the new quantum mechanics enables one to predict the probability of the state of a system at two o'clock if one know the probability of its state at one o'clock. Comparing this statement with the one previously given it will be noticed that the amended characterization is more symmetrical. Indeterminism appears, so to speak, at both ends of the equation instead of only at the end later in time.

Heisenberg based his uncertainty principle upon the limitations inherent in physical measurement, but Bohr has suggested that we are concerned here not only with measurements but with the very concepts themselves. Professor Lenzen has told you that the microscopic physicist has taken over bodily the concepts of macroscopic physics. Gas molecules, in kinetic theory, are idealized billiard balls. To what extent this procedure will prove serviceable is a trial and error matter. Take the question of the nature of light. The first theory was that light is a stream of minute corpuscles. Later the corpuscular theory was superseded by the wave theory, which held sway for a full century. Then it was found that the wave theory does not fit all the facts. If you should ask me whether light is a stream of particles or a wave I should answer it is both. If you object that my answer is self-contradictory I can only reply that I know nothing whatever about the isness of light, I can only tell you how it behaves and it certainly behaves in some respects like a particle and other respects quite as definitely like a wave. Now one of the most startling discoveries of recent physics is that electrons also possess this dual personality. For example, if you shoot them at small obstacles they will bend around exactly as sound waves do.

We can watch the stars in their courses. If the astronomer, who is the macroscopic physicist *par excellence,* is interested in the motion of the planet Mars he can make his observations every night or at intervals of a week or so; it will not make much difference. At the end of, say, a year or two his discrete series of measurements will enable him to do two things.

First: he can verify the causal thread connecting his measurements which is expressed by the classical equations of mechanics.

Second: he can give an accurate description of the *continuous* motion of the planet in space and time.

The causal relations and the space-time picture are completly coherent and compatible.

Encouraged by the success of the astronomer the microscopic physicist applies the same strategy and tactics in his attack upon the atom. He conceives it as a minature solar system. He takes over the concepts of particle, position, velocity, energy, etc., and then applies the laws of mechanics. But they do ñot work. He achieves partial success by supplementing the classical mechanics with a sheer miracle called the quantum jump. However, being a physicist he has a professional distaste for miracles and therefore tries to amend his mechanics so that it will absorb the miraculous element. Eventually he succeeds, but the new equations, although they do establish an order between one set of measurements and another, fail utterly to give a space-time picture of atomic processes. The microscopic physicist has matched the first performance of the astronomer but not the second.

Now it may be that this failure is inherent in the nature of things. While, as I said at the beginning of this paper, the least physics can do is to set up a relationship of order between consecutive sets of observations, it is not self-evident that it must or can also supply a space-time picture. Indeed, that discontinuity which is the most striking feature of atomic phenomena would almost seem to preclude description of phenomena in a continuous space and time. Nevertheless it is found that some sort of picture can be preserved if one gives up the concept of particles and substitutes that of waves. Only then one begins to lose the causal connections. The concepts of energy and momentum fade out of the scheme, and with them those fundamental laws of invariance or conservation which are expressions of causality. The two modes of description seem to be mutually exclusive; but Bohr insists that they are complementary. Both are needed if physics is to accomplish all in the microscopic realm that it did so successfully in the macroscopic.

I have quoted the views of Heisenberg and Bohr. Other leaders in this field of physics have suggested ways of looking at the matter somewhat divergent from these. This is to be expected. It is all so new, so revolutionary and so bewildering.

And now, if I close upon this note of bewilderment you will perhaps agree with me that the situation offers much food for thought and perhaps some grist for the philosopher's mill.

DISINTEGRATION OF INTEGRALS

BY HENRY LANZ

I may conveniently commence this article with an apology. The article is an attempt to apply mathematical methods to the solution of the so-called Zenonian paradoxes. The problem has been discussed so many times in philosophical literature that one can hardly hope to contribute anything new to the solution of the difficulties involved. Moreover it is now almost universally believed that since the invention of integral calculus the problem has been successfully solved once for ever, and there is nothing to do about it except, for pedagogical reasons, to repeat the solution. And yet there is scarcely a single treatise on metaphysics or a volume on logic that does not discuss Zenonian paradoxes with an obvious effort to produce a more convincing or, possibly, a more elegant analysis of the fallacy involved. In justification of the present adventure it may, therefore, be pointed out that the author evidently feels like most people feel who ever come in touch with the problem—that, namely, the other people's discussions somehow do not satisfy him, and that to convince himself he has to work out a scheme of his own making. Driven by this vague feeling of dissatisfaction the author finally embarked upon the idea of formulating the situation as a problem in mathematics with the view of seeing what can be done with it apart from any logical controversy and from the purely mathematical point of view. The history of this "new" enterprise is here being given.

I assume that the historical statement of the problem is well known to everybody here, and thus proceed to the algebraic view of the problem.

If we consider the problem from the algebraic point of view we will find it surprisingly simple. There is hardly any problem in it at all, and the solution can be obtained by elementary methods without any reference to the differential or integral calculus. Let Achilles start from the point O, and let the distance between him and the turtle be s. Suppose that the turtle moves leisurly ahead with the constant velocity b, and let Achilles run after it with the velocity a. It is evident that he can overtake the turtle only if $a > b$. The distance traversed by Achilles in t seconds is $S = at$. In the same time the turtle will make the distance bt, and will be at the distance $S_1 = bt + s$ from the Achilles starting point O. In order that Achilles could overtake the turtle there must be a time instant when $S = S_1$, and that actually happens when $t = s/a—b$. For if $S = S_1$, then $at = bt + s$, and therefore $t = s/a—b$, from which it follows that the time necessary for the performance is, not $= \infty$, as Zeno thinks, using the word "never," but is finite and can easily be found. During this time interval t, Achilles will cover the distance $S = at = as/a—b$, which gives us the distance from O at which he overtakes the beast.

Yet however simple and however correct this result may seem, it does not in the least disturb the firmness of the Zenonian position. Of course Zeno was not so dumb as not to know that Achilles was able to overtake the turtle. He was a thinker, not a freak. Freak was Diogenes who moved his finger in front of his opponent's nose in order that the latter should see that motion is possible. In the conflict between the philosopher and the mathematician it is the latter who assumes the role of Diogenes, and keeps on for centuries moving his finger before our nose in a highly amusing effort to induce us to believe that a perfectly obvious thing does really exist. We all know, of course, that the thing actually happens. We may be greatly obliged to the mathematician for telling us when in every particular case it will happen. But, algebraically at least, he does not show us how the thing happens.

The profound remark that it does not take infinite time for Achilles to overtake the turtle may cause us to change the wording of the Zenonian argument, but does not refute its meaning. For the value of the paradox does not depend on the necessity of spending infinite time in taking all those insensible small steps which the turtle makes for him, but rather upon his blunt inability to do the performance by so stupidly small steps which never end. To think, as Windelband does, that Zeno in his argument forgot that time is also infinitely divisible, means to misunderstand the nature of the argument. The difficulty lies not in the fact that it takes too long a time to do the performance, but in the absurdity of the performance itself, *i.e.*, in the impossibility of building up a quantum by disintegration and subsequent addition of differences. Infinite divisibility of time does not save us from the ill effects of Zenonian dialectics; for the question arises as to how time can be divided to suit our problem. It is originally a quantum disease, and affects space and time only indirectly.

Achilles-turtle race as a problem in the theory of series.

Let us see, now, if mathematics could not help us further. The little steps into which Zeno proposes to divide the track field evidently constitute a series. Let us see if we cannot find some order in that series. When Achilles runs through the distance s that divides him from the turtle, the latter moves a little ahead, and travels a distance s_1 which is smaller than s in proportion to their velocities, *i.e.*, $s_1 = sb/a$. Now Achilles has to run that distance, but at the end he again finds the turtle ahead of him in precisely the same proportion, *i.e.*, $s_2 = s_1 b/a = s(b/a)^2$, and so forth *in indefinitum*. The distances evidently constitute a geometrical progression:

$$s,\ sr,\ sr^2,\ sr^3,\ \dots\ sr^n\ \dots$$

where $r = b/a$, and since $a > b$, r must be less than *1*. From the
where $r = b/a$, and since $c\ b$, r must be less than *1*. From the
well known formula for geometrical progressions we can easily find the sum s-sub-n of any number of members:

$$s\text{-sub-}n = s/1-r - sr^n/1-r = sa/a-b - as/a-b\ .\ b^n/a^n\ .$$

For well-known reasons which are not to be discussed here we know that if $b < a$, the expression b^n/a^n decreases with the increasing n, and can be made smaller than any number t however small, that is—the mathematicians say—it approaches zero as its limit. We can therefore write:

$$S = lim\,(s\text{-sub-}n) = lim\ (sa/a-b - as/a-b\ .\ b^n/a^n) = as/a-b$$

the same result as we had before.

Now, in which way does this result help us? The distance that we sought has been obtained as a limit of a series, *i.e.*, seemingly by adding an unlimited number of steps. Yet 'obtained' is an ambiguous and misleading term. It is often misinterpreted in the sense that, if n increases without limit and actually becomes infinite, S obtains as the limit of s-sub-n. Yet there is a big difference between 'increasing without limit' and 'actually becoming infinite.' The former has a sense, the latter has none. At least for the mathematician it has no sense, except by virtue of a special definition that would attach to it some conventional symbolic significance. Mathematically we do not know what becomes of sr^n when n actually becomes infinite. We only know that with constantly increasing n the expression approaches zero without ever actually becoming zero. The limit therefore can never be obtained by adding an unlimited number of terms.

In taking such a position, however, the mathematician actually, though often unconsciously, supports and defends the value of Zenonian argument. The whole of modern mathematics with its unconditional condemnation of the actual-infinite is fundamentally Zenonian in its principle. In support of this statement I could refer to Russell, but I have no time for quotations. What is the real meaning of Zenonian paradox? It means that, if Achilles were to insist on his absurd way of reaching the turtle by constantly diminishing his steps, he would never reach it. And yet it is widely believed that, using practically the same method, we are in position to obtain certain quantities, called limits. Why is a method which is obviously absurd in one case taken for granted in another case that is wholly analoguous to the first? If Achilles cannot run that way, how can we build limits and infinite series imitating his way? No, mathematician says, Achilles cannot overtake the turtle in that absurd manner because it is impossible to obtain limits by adding smaller and smaller terms. When "we" say "obtain" we mean to obtain the knowledge of the value of the limit, but not the limit itself as a metaphysically subsistent entity. We do not "make" the series for you. We can only show you that, if certain conditions are fulfilled within a series, there exists a limit to it, in the sense that following the rule of the series we can make the difference between s-sub-n and S indefinitely small.

In other words the mathematical philosopher again moves his finger in front of our nose repeating his refrain: "it exists." Instead of explaining to us the puzzle of Zenonian dialectics, he endorses it, and frankly declares it to be the only safe basis on which he consents to build his whole fabric.

The Problem of the Integral

Our chief difficulty evidently lies, not in the race between Achilles and the turtle, *i.e.*, not in comparing the two functions, but in thinking each function separately as accomplished by discontinuous steps. Let the turtle stand still, *i.e.*, think in its place a fixed mathematical point. Reduce Achilles to the size and shape of an electron pursuing its flight within the atom,—and the problem remains practically the same. Think away all matter, points and instants, retaining only the number system, and you will have the same difficulty in building up numbers, if you wish to obtain a continuous set. The difficulty lies in the problem of breaking up a given quantum into an indefinite number of intervals of such a character that not a single interval, if measured and added to the rest, can complete the quantum, and yet by progressive subdivision the desired result is found by taking the limit of a sum of such intervals. This is the problem of disintegration of integrals.

What I mean by disintegration is this. Mathematicians know that every problem in integration is preceded by a tentative and provisional partition. What do we do when we meet a problem that calls for integration? We first divide the required magnitude into a net of intervals or meshes, and see if by increasing the number of subdivisions we do not come nearer and nearer to the desired result. In every textbook on integral calculus we find this explained as the first step in the process of integration. Thus the first step in integration is practically a provisional disintegration. The mathematician has no special reason to consider this preliminary operation, because for him the chief difficulty lies in what comes after that, — the problem of solving the integral. It is quite natural that he speaks of the whole process with the emphasis on integration. But for the logician it is precisely the legitimacy of the first step that presents the greatest difficulty. For he feels that with this first step we deliver ourselves irrevocably to the Zenonian predicament, — "bad infinity," as Hegel calls it.

Mathematical analysis believes it has solved the difficulty by proving what is known as the fundamental theorem of the integral calculus. Omitting the technical part, I shall just state what is mathematically fundamental in it. Euler defined integration as the reverse of differentiation. Thus defined the integral implies no reference to summation. It is not at all easy to see at once where does the process of summation come in here; and why is the original function $F(x)$ to be regarded as a limit of a sum? The fundamental theorem shows how to disintegrate it, *i.e.*, how to represent it as a limit of summation. It transforms an indefinite integral into a definite one. In the hands of Caushy, Dirichlet, and Riemann, the definition of the definite integral gradually attained to an exact arithmetic form which fitted it for the purpose of modern analysis; and in fact the definition given by Riemann leaves nothing to be desired as regards precision. Riemann not only formulated a rigorous arithmetical definition of the integral of a bounded function, but also established a necessary and sufficient condition for the existence of the definite integral. Riemann's integral is a disintegrated integral.

Now, what do we achieve through this disintegration? Mathematically the achievement is of fundamental importance. It guarantees application of the amazing technique of the integral calculus to the problems involving limits of summation. But what we gained logically for the solution of our Zenonian predicament is very little. Have we, indeed, succeeded in constructing an infinite sum? By no means. In the process of integration the reference to summation plays logically the same part as is played by the so-called catalytic substances in chemistry, which precipitate the progress of a reaction without entering into it. In solving integrals the mathematician never appeals to the process of summation. It is very significant that he never obtains his integrals by the same process by which he explains their nature. The fundamental theorem shows that definite integral may be regarded as the limit of a sum. Yet this limit can never be obtained by the process of summation. We know that such limits do actually exist. In geometry they exist with the evidence of the area bounded by a curve. In physics we have innumerable illustrations of the reality of limits. We know that limits are being achieved in nature, which evidently has its own way of reaching them. Moreover, in the integral calculus we possess a proof of their existence and methods for the exact determination of their magnitude. But we still have not the slightest idea as to how they are achieved. Quite in accordance with the principles of Zenonian dialectics, mathematical analysis teaches us that we cannot possibly achieve or construct a limit by continuous division and progressive addition. Nature has her own ways of producing such wholes, — but how, it remains just as incomprehensible now as it was in Zeno's days. The mathematician invents amazingly ingenious methods for the correct determination of the results achieved by nature. But he cannot construct those processes, and—if he is entirely frank with himself—he must confess that he does not understand how they are constructed.

The work of the mathematician is, therefore, in this respect purely subjective. He is concerned with the ways of knowing. He knows how to evaluate results which are reached independently of his evaluation. The work of nature, on the other hand, is entirely objective. It not merely determines, or evaluates, but actually produces the results. And it is precisely this creative production, the industry of nature, that scorns all our presumptuous attempts at rationalisation.

It is, indeed, too presumptuous to believe that motion, number, time, space, *etc.*, could ever be completely understood and rationalised. Their mathematical foundations and logical roots are just as manifold and complex as the whole body of physics, *plus* the entire field of geometry and analysis; perhaps even more complex and by all means more baffling and difficult to reach. We know only a very small portion of every concept that presents itself for analysis. Our ideas are just the beginnings of things. It is highly characteristic of the inherent arrogance of our modern empirical rationalism that mere beginnings are taken for the ends, and insignificant fragments of genuine information are interpreted as ultimate solutions. Those who know the extent of human knowledge in some particular field are inclined to be more modest. By the end of the last century it was almost universally believed that on the foundations of Weierstrass our mathematical edifice rested so securely that nothing could disturb its massive repose. The problem of the *continuum* was arithmetically attacked and brought to an, at least, prospective solution. And yet today, after scarcely thirty years since the death of Weierstrass, there are prominent mathematicians who believe that the mighty edifice is tottering. To indicate the confusion which today prevails in the camp of the mathematicians who investigate the foundations of their science, and to whom therefore should belong the last word in the matter, it may suffice to quote the words of Professor James Pierpont, who in his address presented to the general session of the American Mathematical Society at the annual meeting of the Society, December, 1927, says: "When one hears one of the greatest living mathematicians calmly telling the world that a considerable part of our analysis is devoid of proof, if it is not nonsense, and when one beholds the mighty efforts which the champions of Weierstrass are making to repel those attacks, it is only reasonable, in view of such fact, to ask ourselves, 'Is all well?' "

Thus in the solution of the Zenonian problem the philosopher is left to depend on his own wits. Mathematical analysis makes us realize the great importance of the problem; but it does not help us in solving it.

EMILY DICKINSON — A STUDY

BY HELEN CARY CHADWICK

"All men say 'What' to me, but I thought it a fashion."

There is a spirit in the poetry of this starry character, swinging into full mortal view not until forty years after her death, that grips the heart and mind with unmistakable power. Unlike most of her reviewers, however, I am making no apotheosis, but am trying after two years' study to present the reality of a very human person. Yet after this lapse of time and the entire publicity given her life by her nearest relatives, it is with feelings of awe and extreme delicacy that I analyze one who never sought the world's notice, who passionately desired the privilege of privacy and even requested that her work be destroyed after her passing. In view of her performance, which rises from the personal into the general value, it seems right to regard her wish as an abnormal one, and to yield us her message.

Few precedents for her type have existed in the Old World, and these have usually suffered martyrdom. In her book, *Some Tendencies of Modern American Poerty,* Amy Lowell deplores the fact that, in comparison with European society, America has not produced "a sturdy peasantry." America does not produce peasants, though she imports many and proceeds to make them into Americans, in whose morale the Declaration of Independence is immovably enshrined. Most of our foreign-born citizens and many of the native-born, do not yet comprehend Americanism, which is rooted, not in brag nor recklessness, but in a fixed consciousness of the dignity of the individual, such as the world—as we know it—has never before evolved. Emily Dickinson had this consciousness, and it is a paying study to learn from whence she derived it.

We must know something of her origin, environment and training. She was born in 1830, in Amherst, Massachusetts, a town whose severely Puritanic atmosphere seems to have been accentuated rather than modified by the presence of its College. The old church in which Emily was supposed—wrongly it appears—to worship, in its ugly bare simplicity would have chilled the heart of an anchorite. She speaks of cowering beneath the gaze of hardened saints in a guilty sense of a love for luxury and beauty.

The poet's father, Edward Dickinson, a richly-endowed, upright man, was educated for a lawyer, with all the solemnity of purpose and hope for future service to the world which marked the rare collegiate training of the times, frequently secured by extreme sacrifice on the part of relatives; and Edward began at Yale under the impressive influence of forbears who had been zealous in the nurture of education and religion. His father was instrumental in the founding of Amherst College. Extracts from a number of notes sent to Edward in Yale show the temper of his daily life, e.g.:

"Learning and science without morality and religion are like a man without a soul."

"Remember the importance of the present time, and never forget the hereafter."

In 1819 a message was sent enclosing five dollars with which to discharge any obligations he might have incurred: "Always be manly, but do not expend more than you can pay, remembering that nothing is spent without sufficient cause."

After his graduation and admission to the bar, Edward opened a law office in Amherst, later marrying Emily Norcross of Monson, an exquisite, flower-like little lady of the older type, graduated at a superior finishing school in New Haven. Being well endowed with this world's goods, she brought much fine furniture to Amherst in ox-teams; and the couple settled in the old family homestead, a dignified mansion of brick, picturesque under its great trees, hospitable in aspect.

Emily once wrote her friend Higginson, "Mother does not care for thought."[1] For all that is graceful and noble in life, however, Mrs. Dickinson did care, and her relations with her husband were of the most harmonious nature. It was only in line that their three children, Emily, Lavinia and Austin, should inherit unusual mental and spiritual qualities.

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[1] *Life and Letters of Emily Dickinson* by Martha Dickinson Bianchi. Houghton Mifflin Co., 1924, p 239.

A wealth of woodland environed Amherst in their day, and Mr. Dickinson cultivated his extensive lands as a farm. Emily's love for nature, her intoxication with beautiful color, reminds us of Thoreau. Her father's character and attainments led him far beyond Amherst, and many distinguished visitors frequented his home, among them J. G. Holland, in the earlier days editor of the *Springfield Republican,* Samuel Bowles, Judge Lord of Salem, Emily's especial intimate; and once Holland brought Ricard Gilder, who did not, however, see Emily. Helen, daughter of Professor Fiske, later the famous Helen Hunt, a childhood playmate, was Emily's lifelong friend, as was also Maria Whitney, the beautiful and intellectual agnostic, term of reproach in those days.

The young girl's schooling was of the best, and at all times the family tone favored a free discussion of any subject worthy the attention of serious Christians. At seventeen, Emily was sent to a Female Seminary in South Hadley, noted for its pious administration, an avowed purpose being the training of girls for missionaries' wives. The curriculum, though liberal, was selected to suit the feminine intellect as it was then interpreted; and Emily's clear and vigorous mind soon missed the broader atmosphere of home. "Please tell me who is candidate for President," she wrote in distress to her brother.

An incident occurred here which showed forcibly the trend and solidity of Emily's religious convictions. Christmas day among these people was a dreary time, supposed to stress the mortification of a sinful race. Mr. Dickinson, in common with many, frowned upon Santa Claus as a questionable invader. His son's wife Susan, who was from Philadelphia, reared in a wider notion of religion, at the festive season hung wreaths of laurel in her windows; whereat several of her neighbors hysterically declared she must be a Romanist: but Mr. Dickinson with characteristic justice pacified the group commotion and the wreaths remained in place.

At the school, the day was set apart as one of fasting and prayer, the hours to be devoted to meditation on man's fallen state and his hope of forgiveness. Miss Lyon, the principal, as a matter of form requested that anyone among the assembled students who objected to this weary program should stand; and Emily and her roommate rose. Anguished and amazed by this heresy, the teacher again explained, more carefully, more awfully, more with an air of final judgment, and again put the question. Amid the trembling throng of obedient girls, Emily Dickinson stood alone.

It was then that this semi-gypsy, this being related to the luxury and abandonment of the East, this virginal wildflower of the north, timid to a fault, outfaced the Vested Authority of conscientious darkness with a front as unyielding as that of her granite hills. Her God was a God of Light.

That afternoon she was sent home, unrepentant then and ever after. Her father in all his life never rebuked her, but gave himself in a sometimes puzzled respect to a study of her nature. A hint of his daughter's wildness, tentative because of his enforced harsh self-restraint, was shown in his housing a racer beneath the roof with the family coach horse, and in his slipping away of a Sunday morning to his son's home to enjoy a stronger cup of coffee than the family régime allowed.

Emily returned to South Hadley, but only to complete the school year. Desiring to keep this rare specimen under his eye, her father removed her to the Amherst Academy, and her formal education ended here, leaving her free to enjoy her friends, books and nature. She made a special study of words, sifting and sorting them, her niece says, like jewels. A healthy, happy girl, with a natural gayety which led to many escapades, tame enough today, but which then caused her to be wept and prayed over. The beloved Sue, Austin's wife, was Emily's refuge at these times, her escape from formality and her adored critic; for Susan's was a mind of rare quality and culture. Emily never united with the church.

The long intimacy with Thomas Wentworth Higginson, chiefly by correspondence, began through a note of hers in appreciation of his essay, "The Procession of the Flowers," in the *Atlantic Monthly.* Noting her unusual type, he answered, and at her earnest solicitation became a critic of her verse. She never talked of her literary ventures to her family and they smiled at the intimacy as a pastime. She must have sensed understanding, for she wrote, "They are religious, except me, and address an eclipse, every morning, whom they call their 'Father.' "[2]

No meeting being imminent, he asked for her portrait. She had none, but replied, "I am small, like the wren; and my hair is bold, like the chestnut burr; and my eyes, like the sherry in the glass which the guest leaves."[3] Mrs. Bianchi adds that her skin was like the white velvet petal of the jasmine, her mouth red, her waving hair Titian. Like the faceted gem, her moods flashed under every ray of light.

It was when Emily was twenty-three that Mr. Dickinson became a member of Congress, and removed with his family to Washington. Many of her elders here recognized her brilliant mind; but she shrank from notice, and wearied of too much society. Premonitions and tremors had haunted her future; and when on a visit to Philadelphia with relatives she met her fate, a man with a wife and child. The attraction between them seems to have been overwhelming. Emily fled to her home, where, a few days later, he followed.

The young girl's parents were absent, and Lavinia and Susan were terror-stricken lest she go away with him. But she did not. She was one of those discerning persons who realize deeply that no man can shirk the responsibilities he has created. Only Sue heard the story of that meeting, but Emily has herself told it in her verse.

There came a day at summer's full
Entirely for me;
I thought that such were for the saints,
Where revelations be.

. . . . .

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[2] *Life and Letters,* p 239.
[3] *Life and Letters,* p 241.

The hour slid fast, as hours will,
Clutched tight by greedy hands;
So faces on two decks look back,
Bound to opposing lands.

And so, when all the time had failed,
Without external sound,
Each bound the other's crucifix,
We gave no other bond.

Sufficient troth that we shall rise—
Deposed, at length, the grave—
To that new marriage, justified
Through Calvaries of Love!

The man left his profession, seeking with his family a distant city, dying prematurely; and Emily, through her adequate faith, remained loyal to the end,—to her beloved friend, to the institution she respected, to the community she served.

From girlhood, her ideas of love and marriage were almost celestial in their noble purity, recalling Thoreau's exquisite essay. Love poems she wrote, intended for no eye but her own:

Title divine is mine
The Wife without
The Sign.
Acute degree
Conferred on me—
Empress of Calvary.
Royal all but the
Crown—
Betrothed without the swoon
God gives us women
When two hold
Garnet to garnet—
Gold to Gold—
Born— Bridalled—
Shrouded—
In a day

Tri-Victory—
'My Husband'
Women say
Stroking the melody,
Is this the way?

Emily's later years were spent in rigid seclusion. She never left the house except to wander in the grounds or tend her beautiful garden, or to cross the little grove between her own and her brother's home, his children being her delighted playmates. Yet still, to her former intimates, gifts and letters went often, and her household tasks were done as formerly with skill and with her own dainty touch. In winter, her small conservatory bloomed with choice favorites.

Only once was she known to express a hint of personal ambition and one might add of prophecy, a sentence in a note to Sue in her early twenties: "If I could make you and Austin proud some day, a long way off, 't would give me taller feet." So Emily now probably has taller feet.

Despite her keenly felt sorrows and her deprivations, many a dawn was to her a fresh inspiration, and the sense of joyous intimacy with her Creator seldom—if ever—left her. Her prevailing attitude of reverence towards Nature is expressed here:

Oh, sacrament of summer days,
Oh, last communion in the haze,
Permit a child to join,

Thy sacred emblems to partake,
Thy consecrated bread to break,
Taste thine immortal wine!

She died in 1886, at the age of fifty-six. Mrs. Bianchi draws a lovely picture of the simple funeral cortege, passing through the May fields to the old home cemetery, the small white casket, resting on a bed of pine boughs and covered by a sweeping pall of sand-violets, borne by men who had been her father's

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[4] *Life and Letters,* p 65.

laborers, and who long since had yielded their worship to her singular ladyhood.

The literary career of Emily Dickinson was in no public way wrought out by herself. Indeed, she steadily opposed any attempt to make of her a professional writer. Though interested friends put out at times stanzas they had captured, her sister-in-law Susan says of her, "She never published a line."[5] In reply to a letter from Higginson, in whom she confided fully, she writes, "I made no rhyme, but one or two, until this winter, sir. I had a terror since September, I could tell to none; and so I sing, as the boy does at the burying-ground, because I am afraid."[6] At this time Emily was thirty-two.

The student of poetry will at once accord this timid genius a high place among makers of creative art. But the glory of Emily Dickinson arises from her individual intimacy with her Creator, carried out triumphantly until the end, of which she declares:

God will lift his little girl—
Old-fashioned, naughty, everything—
Over the stile of pearl.

Despite the barren, condemnatory nature of the religion under which she was reared, and which undoubtedly shadowed her whole life with seasons of nervous revolt, her joyous love of Deity led her to joke and frolic in his adored presence. She alluded to the Bible as it was then interpreted with such original wit as to shock her elders, who at the same time were silenced by the beauty of her character; and in later life she calmly ridiculed their awful creed:

Who were "the Father and the Son—"
We pondered when a child,
And what had they to do with us—
And when portentous told
With inference appaling
By childhood fortified

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[5] *Life and Letters,* p 104.
[6] *Life and Letters,* p 238.

We thought 'at least they are no worse
Than they have been described.' "

Her individualism comes out strongly here:

Some keep the Sabbath going to church;
I keep it staying at home,
With a bobolink for a chorister,
And an orchard for a dome.

. . . . .

God preaches,—a noted clergyman,—
And the sermon is never long;
So instead of getting to heaven at last,
I'm going all along!

But there was nothing of license in Emily's sense of spiritual freedom, as she so dearly proved; but rather a deeply rooted conviction that with freedom comes responsibility. The old Quaker doctrine of the supreme authority of the inner Light, the "personalism" of today, found expression in her, "a practical realization of the divine Presence."[7] Mrs. Bianchi says of her, "The contribution to faith which Emily Dickinson made to the world will some day be definitely recognized."[8]

Flashes of art which arrest us in her work are many:

But no man moved me till the tide
Went past my simple shoe,
And past my apron and my belt,
And past my bodice too,

And made as he would eat me up.
As wholly as a dew
Upon a dandelion's sleeve—
And then I started too.

And he—he followed close behind;
I felt his silver heel
Upon my ankle,—then my shoes
Would overflow with pearl.

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[7] *Personalism,* by Borden P. Bowne, Houghton Mifflin, 1908, p 324.
[8] *Life and Letter,* p 95.

Until we met the solid town,
No man he seemed to know;
And bowing with a mighty look
At me, the sea withdrew.

A little road not made of man,
Enabled of the eye,
Accessible to thill of bee,
Or cart of butterfly.

. . . . .

The moon was but a chin of gold,
A night or two ago.

. . . . .

Swifter than the hoofs of Horsemen
Round a ledge of Dream!

. . . . .

So sunset shuts my question down
With clasps of chrysolite.

. . . . .

Tell me what time the weaver sleeps
Who spun the depths of blue!

Emily never loved death, rather the hereafter; but she brooded perhaps too much upon the great mystery:

The grave my little cottage is,
Where, keeping house for thee,
I make my parlor orderly,
And lay the marble tea.

Touches of vivid insight into life were hers, organ-tones from the eternal Harmony, smiting the responsive soul with a strange, awesome thrill:

A light exists in spring
  Not present on the year
At any other period,
  When March is scarcely here.

. . . . .

It waits upon the lawn;
It shows the furthest tree,
Upon the furthest slope we know;
It almost speaks to me.

Then, as horizons step,
Or noons report away,
Without the formula of sound,
It passes, and we stay.

Speaking of a time when she nearly reached the other side, but recovered, she says:

Next time, to tarry,
While the ages steal,—
Slow tramp the centuries,
And the cycles wheel.

But the child heart never forsook her, and in sharp contrast we find her rollicking with the great Life, as a kitten digs his tiny claws into the mighty earth in a mad partnership of dance.

Inebriate of air am I,
And debauchee of dew,
Reeling, through endless summer days,
From inns of molten blue.

When landlords turn the drunken bee
Out of the foxglove's door,
When butterflies renounce their drams,
I shall but drink the more!

Till seraphs swing their snowy hats,
And saints to windows run,
To see the little tippler
Leaning against the sun!

There has been much said regarding Emily's literary style. Mrs. Bianchi claims that she invented the "new lyric," and that against classic forms "her revolt was absolute."[9] I do not so read her. The so-called "new lyric" was brought into favor by

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[9] Introductory note to *Complete Poems,* Little, Brown & Co., 1926.

Whitman, but his imitators seem all too unwilling to own their master. Emily appeared largely indifferent to form, writing commonly in the somewhat stiff and prosaic iambic trimeter or tetrameter; but it must be admitted that these became music under her touch, and her imperfect rhymes and irregular rhythm usually satisfy the artistic feeling; so perhaps she may have meditated a revolt, but I doubt it. Much of her best work is classic in form.

Referring to her most prized and most competent critic, Higginson, Mrs. Bianchi says, "She never altered one line to please him."[10] In view of the fact that Emily took the initiative in supplicating Higginson[11] to become her tutor, it would hardly seem in keeping with her sincere and modest spirit that she secretly assumed herself superior to his freely given instruction. Moreover, she writes in a letter to him "Are these more orderly? I thank you for the truth;"[12] which would indicate that she did alter in an attempt to please him. The whole trend of her correspondence with Higginson suggests that she was unable to profit by his skilled help. It takes years to form a good technique in any of the fine arts, and Emily's preparation for literary work was scant. She lacked too the spur of ambition for wordly success. Although she was "besieged for poems" by admirers, Higginson, outlining her faults of style, advised her to "delay to publish;" and she replied with characteristic wit that the idea of publishing "is as foreign to my thought as firmanent to fin."

A writer in the Atlantic says, "Emily Dickinson differs from all the woman letter-writers of France and England in her scorn of detail, scarcely hitting the paper long enough to make her communication intelligible." With the latest edition of Mrs. Bianchi's *Life and Letters,* published by Houghton Mifflin in 1925, is the publishers' note: "Of especial interest are her letters, each as clear-cut and flawless as one of her poems." This criticism comes from an ecstasy of heroine-worship, and requires modification.

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[10] *Life and Letters,* p 71.
[11] *Life and Letters,* pp 238, 241, 242, 244, 266, 301, 324.
[12] *Life and Letters,* p 243.

Is is generally understood that the historian who loses his head over a character has missed the mark in reliability and sacrifices his value except as a romancer.

Some of Emily's letters are as clear-cut and flawless as many of her poems, but some of both are worthless because incomprehensible.[13] After her father's death, which occurred when she was forty-four, she seemed gradually to lose the power of self-criticism, and to leave much of her meaning unsaid. The seclusion in which she lived for years, the shocks of sorrow, apparently led to a slightly abnormal functioning of that brilliant mind, which in earlier days had never failed of coherence in her most subtile flights.

The Dickinson family, while literate to a degree, probably through a conservatism induced by their rigid religious ideals, failed to contact with the wave of emancipating thought sweeping through their times. In reply to a question of Higginson regarding Whitman, Emily said, "I never read his book, but have heard that it is disgraceful."[14] And this at a time when many high-grade persons were seeing the inherent purity of Whitman. She alludes to Thoreau in her correspondence only once: "The fire-bells are oftener now, almost, than the church bells. Thoreau would wonder which would do the most harm."[15] Here is, however, a hint of sympathy with the great iconoclast. Emerson, though said to be a favorite, is seldom mentioned; and even concerning Browning, whom she claims to have read, she says to Higginson, "I never heard anyone speak of 'Pippa Passes.' "[16] On the large endeavors of Alcott she makes no comment. Originality was native to her; she was never the follower—her thoughts were her own.

Yet Emily Dickinson belongs, by all the vital escapes she made for her soul, to the Concord group, including also Whitman, who was so closely allied to them. Thoreau was only thirteen years her senior; the first edition of *Leaves of Grass* was published when she was twenty-five. Emerson, Alcott and Margaret Fuller labored together for ideals like her own. The great transcendentalist movement, aiming at individual freedom and excellence, was as much her motive as if she had understood it.

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[13] *Life and Letters,* pp 311-12, 378.
[14] *Life and Letters,* p 239.
[15] *Life and Letters,* p 330.
[16] *Life and Letters,* p 242.

Under a democratic government, persons of a more symmetrical development naturally appear than is possible where class rule obtains; for in the democracy the estimate of individual value is constantly rising. To such persons comes more of vision and of power to see life as it is in the Absolute, and a resultant persistence in a spiritual renaissance elevating as a practical step endeavor above mere worldly success. To them *memento mori* no longer means isolation from the world as a preparation for a higher life, but a searching of all things in the world to enable us the better to judge a conduct of life leading to a lasting success. This may be called scientific living, but it is also a religion so broad as to astound us by its necessary tasks.

Something indeed of the loneliness bred by her ultra modernity haunted Emily's visions and stayed her advance, but not vitally. Forerunners there must be, holding their lamps aloft with aching arms in the darkness, wondering if others see the light; but, after all, their message is their reward. It is to such, and to the aspiring faithful everywhere, that civilization owes its progress; for it is through the insistence of the latter class that the new type is enabled to come. That God's truth is forever assuming higher forms, according to man's ability to perceive, is not crystallized in the fiats of a vanished people, but is a unique and authoritative expression with each individual more compelling and intimate than any outer authority can be, is the evangel.

ISAAC PENINGTON—THE QUAKER PHILOSOPHER

BY M. WHITCOMB HESS

Nowhere in his works does Isaac Penington refer to Plotinus or to Neo-Platonism. There is no evidence that he had read the *Enneads*, though it is possible that in his English school-boy days he had heard of the Alexandrian. Still, separated by many centuries, there exists between Plotinus and Isaac Penington such constancy of intellectual and emotional attitude that to be a Neo-Platonist like Plotinus is to be at once a Quaker like Isaac Penington. The following quotation from the *Works of Isaac Penington,* published in London in 1681, is one of many to illustrate this likeness:

> Belief in darkness (which is unbelief toward God) disunited the soul, and closed up the spring of life from it; belief in the light, which is sent to lead from the darkness, unites again, and opens up the springs again. God is light, he dwells in the light and there enjoys the fulness of life: and he gives a measure of his own light to draw from the darkness.

Fourteen centuries later than the great Neo-Platonist, in the first three-quarters of the seventeenth century, Isaac Penington lived in England. During his life, and for thirty-six years after his death, over in France, Louis XIV was enjoying the "divine right of kings" on the terms of a Caliban. But just across the channel Isaac Penington knew another, truer divinity, which leaped so brightly in his soul that even in Reading gaol where he was imprisoned for his belief, he found the never-failing "well of life from which pure life springs up," as he wrote to his friend, Nathaniel Stoner, on August 24, 1678. The father of the early Quaker was Sir Isaac Penington, a noted member of the Long Parliament. William Penn married the step-daughter of the younger Isaac, whom at about the age of forty contact with the Quakers had converted whole-souledly to the persecuted sect.

"This is he, this is he, there is no other; this is he whom I have waited for and sought after from my childhood, who was always near me, and had often begotten life in my heart, but I knew him not distinctly nor how to receive him or dwell with him." In these words, Isaac Penington sought to express his knowledge of truth's home-coming to him when he first heard the outcast Quaker preacher. The reader recalls the statement attributed to Plotinus when he first found the lecturer, Ammonius Saccus: "This is the man I have been looking for." The world-forsaking, light-seeking Neo-Platonist appears again in Isaac Penington's realization of that presence Plotinus felt so often, "an actual presence superior to any knowing." Superior to any knowing Penington found it too, as he tells us in these words or others again and again: "Knowledge without life dulls the true appetite." This knowledge without life is his interpretation of the forbidden fruit of Genesis. Many a mystic has seen the harm of knowledge when it is viciously abstracted from reality. Plato has Socrates decry in the *Phaedrus,* Theuth's invention of the alphabet because Theuth created with words. How can dead letters carry the living flame that leaps from soul to soul? Nietzsche in his essay on the use and abuse of history speaks as strongly against theory in its divorce from action.

"The light," says the Quaker Plotinus, "is not to be comprehended but gathered unto itself and comprehendeth." In another context we read: "All ye that cry up universal love from sweet sense of its image, ye shall one day know that one act of particular love from the true nature exceeds this in its utmost extent." "Knowledge may speak peace," we are told; again, "the light will not speak peace so, but only where the virtue of the living blood is felt, cleansing away sin." Once more, "All the knowledge, all the true knowledge that ever ye had of God was from a light within. I do not deny," he continues, putting a volume of metaphysics in a few words, "that ye might receive your knowledge through the Scriptures (and some warmth formerly in those things which ye call Ordinances and Duties) but that whereby we received the knowledge was the Light within, the eye that God secretly opens in your spirits."

It is the *secretly* opened eye with which the Quaker is so much concerned. One walked in darkness and suddenly light floods one's way forever. The Quakers have contributed little to philosophical literature. Their religion looks too askance at man's efforts, and in this very attitude appears the great philosophical truth of the ages. Spiritual determinism alone is freedom. Only when man's will is his to make it God's does he know the light within. What brings man to this understanding? Not his own wisdom, for in the absence of the spirit the individual by self-diremption cannot recover it. "Nay thou canst not so much as wait for him or breathe after him without his help." But, we are assured, "He is nigh to the poor, the broken, the distressed, the helpless." Why? Just because of the tacit will-surrender. "Oh, do not with thy fleshly cries and roarings"—here is rude human will—"think to awaken thy Beloved before his season," when His season is, to be sure, in man's complete, childlike trust.

The keynote is trust. "Indeed this is the true religion, to feel God beginning the work, and to wait on him for his carrying it on." Instead of being a help, man's wisdom blocks the way. "It will hurry thee on in the path of error. Every step of the way it will be laying baits for thee under an appearance of spiritual wisdom." What gives man the sense of his dark nature is something wholly different from it, and this is why the wise cannot believe. "They can comprehend the knowledge which they can gather out of the Book of Nature, or out of the Books of the Law and the Prophets. . . . but they cannot comprehend the light which all these testify of."

"Turn from your idols," urges the evangel, "return to your simplicity . . . to your first love, and the Lord will receive you, though you have wandered after many lovers, and have been inflamed with the love of idols under every green tree." This is impossible, however, as long as knowledge without life or man's wisdom is the predominant interest: "The seed of the kingdom is little, and ye are great, how can ye enter into it?" he asks with gentle irony. Again: "Ye are too high, too wise, too knowing for Christ, or for the sight and acknowledgment of the true means which lead to life."

As nearly as it is possible to generalize about it the Way to Truth is found in the imperative: "A man must become as a child . . . as a child he must be taught ,and the Father teaches by giving desires according to the present need". When the spring stirs, it moves toward the center, which is source, light, power. It is not the doing of things which is of value, "but it is the doing of things in the virtue, in the life, in the power that comes from Christ, which is of acceptance with God, and of advantage to the soul."

Because of his conviction that the Way and the Truth are one, the statement Bradley found insurmountable to thought "In the will to seek God there is God most to be found," would not have bothered Isaac Penington. "There is no safe dallying with truth," he says in one place, and for the reason that it is impossible to stop with the will is Bradley's doctrine so true. God's presence in the desire to seek Him appears stupendous because of the contrast present between darkness and light. That first Image remains precious to the seeker who, seeking, finds. For, in the view of Isaac Penington, it is not an impossible strain on the imagination to find God, also. Indeed, it is the meaning of the search. "The Seed of God cannot sin," the Quaker is assured, because "he that feels the Eternal Power beginning the work cannot doubt but that he can perfect it." To his brother, Arthur, who became a Roman Catholic, Penington wrote on July 20, 1676: "But that the work of regeneration is only begun in this life and not finished till the other life, *that* is a great mistake. The holy leaven is put into the lump *here.*" In this letter he writes also: "There is a state where the spirit is willing but the flesh is weak: yet it is not so where the spirit has become strong in the Lord."

The unity of reality is primal. "The Father is light, and the Son, light; so that the Spirit which draws to them must be light also." In other words he says the same thing: "The substance when it is shadowed out or nakedly dispensed is one and the same." It is because of this inherent unity that growth, which is a human phase, is possible. "Man fell from God, lost the Image of God," the Quaker Plotinus declares, "but the Spirit of God is light and shines in the darkness . . . This light is the immediate voice of Christ. Outward preaching, reading the Scriptures and so on may direct and encourage man to wait for the voice, but words are of value only as they bring man to "the knowledge of things beyond what words can utter." For "the *name* wherein the asking and acceptance is, is *living;* and he that prayeth in the motion of the Spirit, and in the power and virtue of the Son's life, he prayeth *in the name,* and his voice is owned of the Father, and not the other, who hath learned in his own will, time, and spirit, to use those words relative to the Son."

SHELTER

BY SALLY BRUCE KINSOLVING

I have a roof to house me
And a fair white bed . . .
I who would be lying
With stars overhead;

Sweet grasses for my pillow
And nothing to cover me
But a fresh wind blowing
Songs from the sea!

ANILINE DYES—SUNSET COLORS

BY FRED SMITH

Pleasant is that experience when, through the clarity of another's contrasts, we find an old distinction brought to the excellence of newness. Here is pleasure accompanied by power. We come to a freshened understanding of a proved value. Unless we take specific care with regard to this matter the keen cutting edge of all things is blurred by time. Lengthening acquaintance with anything (so many proverbs attest) tends to develop lethargic attitudes. Every area of life could easily be culled for illustrations of this fact. For the purpose of this present discussion I propose to go no farther than the field of literature in order to find a worth-while illustration of the studied contrast hinted at in our title.

Pragmatically considered, education is given for the understanding of values. It teaches us to differentiate, to contrast, to define. For us who came up through the delight (our children call it the discipline) of the Victorian era of literature there was duly impressed upon us the important distinction between fancy and imagination. Some of us who seek to be at once perpetually contemporary in our interests, while at the same time remaining conservative with regard to proved values, are rather suspicious that, in our day, the fascinations of the former are tending to eclipse the values of the latter. In so far as this is so I confess to a feeling of deep regret.

A literature that ceases to be imaginative ceases to be great, whatever else it may happen to be. The ephemeralities of fancy are of time, not eternity. Fancy walks among the perfumed meadows; imagination points us to the rugged mountain peak. One is interested in the filigree of life, the other, in its undergirding faith: one lives for play; the other, for progress. To blur this distinction is to dim the real values of life. And I, living too much perhaps in the Victorian terminology as well as in the Victorian tradition, had begun to think that men had forgotten this old-time valid distinction of worth.

I am happy to say, however, that I stand corrected. For this correction I am indebted to Rebecca West. She has used this old-time distinction with Davidic force to the down-bringing of the mighty. In reviewing some time ago a much heralded book she said of the author that he had used "the aniline dyes of fancy rather than the sunset colors of the imagination."

Now that I have read and savored this contrast to its final meaning I find myself wondering that no one has etched it so beautifully (and I use the word advisedly) before. As Rebecca West used it it became a scimitar of judgment. But as I savored it, it became a thing of double value. Both of these values have a positive worth in the work of literary evaluation. There is no condemnation for those who prefer to use "the aniline dyes of fancy" provided that they use them in good taste and truth. Color is for the enhancement of the thing colored, not for its detrition. But this is to turn toward another theme and there is not space for that in one article. It is enough to see that for great literature color, whether as "aniline dyes" or "sunset colors", is for the addition of emphasis. When it destroys, it ceases to be great literature; it becomes satire.

But now to the significance of the contrast as it appears to me. It so happened that as a lad I attained to the viewpoint of an interested student in chemistry. It was an interesting episode. Even as I read the phrase "the aniline dyes of fancy" I determined that I would read again the remembered chapter of Edwin P. Slosson wherein he enthuses almost to the verge of poetry concerning the gorgeous hues of the aniline dyes. Herein he shows that all, through the aid of the chemist, can now be "born to the purple", for the secret of the once famed Tyrian purple, the distinctive insignia of royalty in ancient times, is now the common possession of all well-informed chemists. The chemist of today has the secret of color. He can construct, compose the aniline dyes, but— he cannot create a sunset.

Once we light upon the worth and the boundary of this fact we can appreciate to the full the force of Rebecca West's double simile. It becomes a gauge of value for more than a mechanical novelist. For the chemist of to-day is not a creator; nor, as

Slosson brings out, is he any more a discoverer; he is a constructionist. And Rebecca West says of Sinclair Lewis that he "uses the aniline dyes of fancy." "I have learnt," says a character in one of Romer Wilson's books, "not creation, but construction."

This differentiation becomes explanatory of much in modern literature. One feels oftentimes in reading the offerings of our modern writers that he is in touch with someone who knows more about technique than he does about the truth of things. They arrange words. I find my opinion re-enforced by coming upon the following conclusion recently in an English periodical. The writer, in commenting on the fact that so much of modern verse is unintelligble, advances the following reason that "not infrequently the imagery of modern verse is the imagery of the fancy, as opposed to the imagery of the imagination." The difference between these imageries is then explained succinctly as follows: "The appeal of an image of the fancy is trifling or affected or ingenious or quaint, according to its content and its context. The appeal of an image of the imagination is universal." In other words one is an "aniline dye" but the other is a "sunset color." One comes to expression on the basis of information; the other, through intuition.

And now, in the light of a reburnished contrast, one can afford "to take a turn up and down" along the well-beaten and well-worn paths of our youth when Ruskin and Emerson and Wordsworth, not to mention others, were beacon lights for our guidance. Then we learned that fancy was descriptive rather than divinative; portraying the surface rather than penetrating to the depths. The deeper things were the work of the imagination. If it is long since you glanced into your Ruskin to see what he had to say "Of the Imaginative Faculty" you will find him not yet antiquated. Emerson also said things of perennial value with regard to these related yet contrasted things. What makes them still of worth to our time is that these men not only knew the relative powers of fancy and imagination; they also knew their places. This latter fact has not always been well discerned in our time either in the realm of art or literature. There has been a confusing of fancy with imagination. Perhaps one reason why we have so many minor poets in our time is due to this fact. They give us poems of fancy rather than poems of the imagination. But, as Shelley told us, "poetry is the expression of the imagination."

The mention of Shelley reminds me that those were the days when men came into a vivid and new appreciation of the place and power of the imagination in literature: "the Romantic Revival" as Max Plowman described it, "which burst upon a prosaic world with the advent of Wordsworth, Coleridge, Shelley and Keats." Of the now forgotten Joseph Warton of the eighteenth century it was said that it "appeared to him that versified observations on familiar life and manner had usurped the honors which were exclusively due to the bold and inventive powers of the imagination." I wonder at times if fancy has not in our day, too greatly usurped the "bold and inventive powers of the imaginative." We are very good at filigree work, thank you; but rather afraid of handling the grand finalities. Aniline dyes instead of sunset colors. And sometimes we catch ourselves wishing for an artist of words who "shall splash at a ten-league canvas with brushes of comet's hair." Some there are who thought that "imagism" had some value for essential poetry. Perhaps it had. My impression is that it had a value, but it was for prosody, not for poetry. It was an aid to the filigree workers in fancy but not of other than incidental worth to the imaginative poet. One thinks in terms of patterns; the other in terms of power. Speaking of the poetry of Amy Lowell, Carl Van Doren acutely observes that "she painted the vivid surfaces of human existence and did not always communicate the drama stirring beneath them. True to her creed, she confined herself to the essential image, drawn with a hard, clear outline." Imagism was poles asunder from imagination. Yet Amy Lowell wrote "Patterns." Imagination could not be denied. Imagism forgot that words are more than entities; they are environments. They are energies. This the imagists forgot. They worked hard at their poetical tatting.

They wandered strenuously in the meadows. But some prefer the mountains. I am willing to have the image, provided you do not take away the power of my imagination. Perspective, I know, is relative but it should also be far reaching. It is not enough for one to describe; he must also divine. Arthur Davidson Ficke knew this when he wrote:

> I am in love with high far-seeing places
> That look on plains half-sunlight and half-storm.
>
> . . . . .
>
> I am in love with all unveilèd faces.
> I seek the wonder at the heart of man.

The aniline dyes of fancy are good, but give me, as a rule, the sunset colors of the imagination. When I am in the mood for the former Robert Bridges and Amy Lowell have a value.

But when I wish to rise on the wings of the imagination I turn to my Thompson, or to Shelley, or, in chosen places, to Wordsworth, and I am satisfied. There are others, but it is not mine here to catalogue names. Even among the elect we all have our favorites. Coleridge writes concerning Wordsworth: "I challenge for this poet the gift of imagination in the highest and strictest sense of the word." So Coleridge. But Francis Thompson was not then born. So myself. I wonder who is your choice?

It has pleased me much to come upon this contrast of Rebecca West's. It proves to be definitive of much. With a clarified vision one can see the worth and value of each. The dealer in "the aniline dyes of fancy" as compared with one who moves among "the sunset colors of the imagination," is related as is the craftsman to the artist. One composes; the other creates. One works mainly according to information; the other knows the supreme worth of intuition. Yet both, in their own way, are the servants of beauty. Aniline dyes—sunset colors; having regard for both is an enriching thing. Yet the ancestral voice of my Victorian upbringing postscripts this resolve with the caution to beware of any who presumes to assert that the aniline dyes are also the sunset colors. He has the key of discernment who knows how to evaluate each in its own worth, not giving to either the power of eclipse over the other.

CURRENT THOUGHT

Self-Identity

The widespread abandonment of the concepts of substance and identity in physics under the use of such concepts as "event" or "process" is a characteristic phase of contemporary thought. Mr. H. J. Paton in an article on "Self-Identity" in *Mind* for July calls attention to the parallel attempts of recent date to apply the same methods to the mental world. "The theory is being propounded that minds can be analysed without remainder into a series of mental events, or even of events which are not mental, related to one another in accordance with certain principles or laws." The article is a very pertinent challenge to the success of this venture.

Holding that many modern thinkers have reverted to the position of Hume while either ignoring or failing adequately to refute the work of Kant, Mr. Paton expounds Kant's argument for the Transcendental Unity of Apperception as the basis for his doctrine of self-identity. It is the identity of the self as subject-knower which is emphasized in distinction from the self as object-known:

> There can be nothing more misleading than to confuse this question of the necessary identity of the self as knowing with the quite different question of the identity of the self merely as something known. We are here interested, not in the self-identity of the object-self, but in the self-identity of the subject-self. . . . There must be one self which is the same self in its different apprehensions, if there is to be apprehension of any temporal object, and still more if there is to be knowledge of an objective and ordered world.

The writer reviews several doctrines of Mind proposed as alternatives of the self-identity theory, including those of Mr. Russell and Mr. Broad, both of whom accept the doctrine of the "spacious present" as effectively satisfying the need of personal continuity, and who propose, respectively, the "mnemic-causation theory" and "trace theory" of memory. In no case, however, Mr. Paton insists, "is the Kantian position both faced and refuted." Either the opponents of this view seek to prove that the self is not always its own object, which is not the issue, or they utterly fail to destroy the argument. The assumption of a knowing self is not without difficulties, the writer admits, and concludes that "All I claim is that I have set forth a certain minimum of truth," which "indeed has not been really faced by the theories I have considered."

Marxism In Japan

Reports have been current of late that Marxism is making devastating conquests in Japan. To lay that fear and to demonstrate the final confutation to the Marxist, especially at home, Mr. Chikao Fujisawa writes in *The International Journal of Ethics* for July on "Marxism, Communism and the Japanese Spirit." After several years with the

Secretariat of the League of Nations the writer is now Professor of International Law at the Imperial University of Kyushu at Fukuoka. The discussion may be taken to represent the official point of view, and probably should be considered in the light of recent attempts of the late Tanaka government to suppress the teaching of Marxism in the Imperial Universities.

Both communism with its class hatred and capitalism with its unbridled competition Dr. Fujisawa holds to be the natural result of the atomistic individualism and excessive egoism which he, in common with many other Eastern critics, charges against Western culture. He deplores the inroads made by capitalism, and particularly its "bourgeois hedonism," upon Japanese intellectuals. This, no less than communistic Marxism, is a part of the great "damage to our moral life" done by Western ideas since the Russo-Japanese War. Both are to be rejected as the foundation of social institutions. The writer suggests that the West as well as the East might find the way out of present political turmoil in the traditional spirit of self-abnegation which is the basis of the Japanese national structure.

> The ideal type of society we are anxious to create must be that soaring high above the low dimension of egoism, in the grip of which both capitalism and communism are grappling with each other in a death and life duel. . . .
>
> It is a wonderful thing for the civilized world that Japan retains the distinctive features of the typical community, and that its ethos has still a strong hold upon the greater part of her people. It is due to this fact that the Japanese nation has exhibited a marvelous vitality and an unusual cohesion throughout the whole of its eventful history. . . . In striking contrast to the sad destinies of Occidental dynasties, the Japanese imperial lineage, transmitted right down to the present in an unbroken chain, offers the strongest security of the state. The national structure of this country is nothing less than an *organized feeling* of the whole people, and it is manifest that this constitution, unique in the world, bids fair to assume ever increasing significance, the more so as the prevalence of unfettered egoism threatens to undermine the social foundations of the West.

Japanese culture has been enriched before from alien sources, particularly Buddhism and Confucianism, without losing individuality. Western culture must now be assimilated in the same fashion:

> Full of radiant vision, we do hope that the affluence of foreign cultures in this country will one day give birth to a wonderful synthetic civilization, no counterpart of which would be discovered in the whole world.

Albion R. King.

NOTES AND DISCUSSIONS

The Mountain Pathway

On emerging from the *Inferno* the pilgrim Dante is importuned by the "bliss-bound wandering spirits" there to "Tell us the mountain pathway, if ye know." More than a vast number imagine that is the demand of our falsely-called "materialistic age." Our materialism is but surface deep but this is enough for the assurance of our surface-speculators whose name is legion. Such claims see only the flotsam and jetsam of our moving tides and bear no intimation of the deeper undercurrents which are the tides themselves, nor of that celestial mechanics which rules the whole movement.

Any serious acquaintance with the younger generation is pretty certain to convince one of the downright seriousness of their attitude toward life. They are seeking with due diligence the nobler solutions to life's problems. But grossness is the characteristic of materialism. It always assumes itself to be the final arbiter, the ultimate solution of all. It poses as being the only "scientific" system in the field. It takes pride in cynicism as if cynicism were a virtue. It shuts from its purview the really significant factors of man's progress and history because it begins by assuming them non-existent. It dare not take honest inventory of its own position for fear of self-destruction. It refuses to believe the death-rattle in its own throat.

Its weakness is inherent but youth and life cannot for long remain with the cynicism of materialism. The age will run to any leader that can really point out the mountain pathway. Men are only suspicious of old sign-posts that have too frequently misled them. The mountain pathway is not necessarily an old one. It is not the paths but the heights that are important. Breaking a new trail is not a sin and it is a far more fascinating task and more promising than slavish deference to the past.

Of all days these are days to point the upward pathway from miasma, fens and briers of uncouth good, and outworn formulas of truth. Our age must discover for itself and it must work toward the skyline. It will be found that all pathways converge at the top. R. T. F.

The Laying of the Corner-stone

Through lack of space there was unhappily omitted from the last issue of the Personalist, notice of the laying of the corner-stone of the Seeley Wintersmith Mudd Memorial Hall of Philosophy, University of Southern California, which occurred on the afternoon of Thursday, May sixteenth. The ceremony, which consisted of an academic procession, remarks by President Rufus B. von KleinSmid, prayer by Reverend W. L. Y. Davis, D.D., and the laying of the stone with the assistance of Mrs. Seeley W. Mudd, Dr. Seeley G. Mudd, Harvey S. Mudd, and Charles E. Seaman, was carried out with impressive simplicity. Adjournment was then made to Bovard Auditorium. The ensuing Convocation Program included as its central interest an address by Dr. Ralph Tyler Flewelling, Chairman of the Department of Philosophy, University of Southern California, on "Why a School of Philosophy?"; an address on "Three Elements in Human Progress," by Dr. Robert A. Millikan, Chairman of the Executive Council, California Institute of Technology; and Announcement of Honorary Fellows and Founders of the School of Philosophy and Conferring of Titles by President von KleinSmid, University of Southern California. Invocation was made by the Right Reverend W. Bertrand Stevens, D.D., and Benediction by Reverend Bradford Leavitt, D.D. Selections were played on the great organ of the auditorium by Dean Walter Fisher Skeele, of the College of Music.

Ghandi on Buddhism

In a recent visit that Mahatma Ghandhi paid to Ceylon, home of Hinayana Buddhism, he received a warm welcome from the faithful there; and in reply spoke at some length regarding his attitude towards the faith that for so many hundred years was dominant in India. His eldest boy, he told his audiences, had often accused him of being a follower of Buddha, declaring that the modern Sanatana Dharma is really a revival of the old cult; and he did not resent the accusation. It is his deliberate opinion that the essential part of the teaching of Buddhism now forms an integral part of Hinduism. By his immense sacrifice, his great renunciation, and the matchless purity of his life Gotama left an indelible impress on Hinduism; and Hinduism owes him an eternal debt of gratitude.

Ghandhi summed up the vital elements in Buddhism under three heads. The first is a belief in an all-pervading Providence; an eternal and unalterable existence of moral government in this universe, a law that is God himself. Next comes belief in a future of the soul in Nirvana, purged of all that is base and vicious, of all that is corrupt and corruptible. Nirvana is not, he declared emphatically, the black dead peace of the grave; it is the permanent peace and happiness of a soul which is conscious of having found its own abode in the heart of the eternal. The third point was his insistence on the sanctity of all life, higher and lower, giving an attitude of loving-kindness to the believer. This last was Gotama's great contribution to humanity and the world.

James Main Dixon.

The Paul Carus Lectures

The Committee in charge announces that the third series of lectures on the Paul Carus Foundation will be delivered in 1930 by Professor G. H. Mead of the University of Chicago, and Visiting Professor in the University of California. The lectures will be delivered at the annual meeting of the Pacific Division of the American Philosophical Association to be held during the Christmas holidays at the University of California, Berkeley, California. The title of the lectures has not yet been announced.

Along the Bookshelf

The French Spirit

THE LIFE AND DEATH OF AN IDEAL, by ALBERT LEON GUERARD. Charles Scribner's Sons, N. Y. 1928. Pp. x-391. $4.50.

MONTAIGNE, GRAVE AND GAY, by ANDRE LAMANDE. Henry Holt and Company, N. Y. 1928. Pp. xvi-303. $3.00.

VOLTAIRE, GENIUS OF MOCKERY, by VICTOR THADDEUS. Brentano's, N. Y. 1928. Pp. 291. $5.00.

The most interesting historical narrative is ever bound to be that which gives the back-lying philosophy of the movements recorded. A perfect example of this type of writing is to be found in Guerard's *The Life and Death of an Ideal.* In fact the book might almost be entitled *A Prolegomenon for the Understanding of French History of the Sixteenth, Seventeenth and Eighteenth Centuries.* The author is blessed with an unusual understanding of French character and psychology and his own detachment from that tradition has rendered him judicial. Besides all this he brings to his task a profound knowledge of the force that made history in the period under review, and a most charming way of telling it. To all people who have an interest in French history—and who has not?—this book will be hopefully begun and avidly finished, the author holding the interest to the very end. Here is no detailing of chronology but a glimpse of those forces cultural, philosophical, racial and religious which were laying the foundations of modern French culture. The weakness as well as the strength of that culture are here detailed. We seem to be the spectators of the making of the most fascinating period in the history of modern civilization.

Now is the time in which it is most important that Americans should understand the French. And here is given the cue to the national outlook from the Frenchman's revolt against taxpaying to his sense of nationalism. It would have been impossible probably for any man not of French birth to have led us to so sure an understanding of those very elements which render the French spirit so lovable and, to an American, so complex and so puzzling. This is therefore a real contribution to national understanding. We wish that Professor Guérard might with equal ability interpret America to the French, for though there is between individuals the highest amicability, there are nationally, thanks to the politicians and the newspapers which hope to profit by the discord, many causes of irritability and misunderstanding which might easily become tragic. This is most unfortunate, because the Gallic and the Celtic elements are naturally prepared for mutual understanding and America in her traditional development has been more Celtic than English.

The transition into the spirit of the Renaissance is thus summarized:

> According to the old story, the world was awaiting its doom at the turn of the first millennium. Nothing happened: and that very "nothing" brought the release. In the same way, the late medieval world was filled with nameless anguish, because its spiritual stars had been obscured. But no apocalytic catastrophe occurred. France worked on and prospered, although Popes and Councils wrangled, and the Sorbonne was in its dotage. There were no eternal stars then, only flickering lanterns carried by bewildered men. When this was realized, France burst out laughing at her former guides and at her former fears.
>
> The first condition of Rabelais's joy in life was his escape from the nether world of spiritual dread. His antimonachism and his anti-Sorbonnism are fundamental. Not that they were wholly new: to poke fun at monks and theologians had been a favourite theme throughout the Age of Faith. But whilst *men* had been attacked, with a fierceness that surprises the modern mind, spiritual authorities were not directly challenged. With Rabelais, they are not so much challenged as ignored. The medieval satirist, whilst he is jeering, turns round uneasily, in moral fear of the Devil; he is ready to fall on his knees before the very friar he is deriding. Rabelais's laughter is perfect freedom. He had later to compromise, to edulcorate his attacks, for he had no desire of becoming a martyr. But if his pen was not wholly free, his soul was tormented by no scruple and by no fear. And it must be remembered that Rabelais is not a solitary genius. He was a sociable, active, practical man, in close touch with his times. His books were immediately and widely popular, as he had meant them to be. He was protected, in his adventurous, semi-detached ecclesiastical career, by great lords and even by Princes of the Church. He may be taken, therefore, as a symbol of the medieval mind emancipated at last: emancipated, not through the magic of ancient books, but simply because it had steadily grown, whilst its keepers had fallen into decay.

There is room here for but a taste; but we assure our readers that here is a book they will not only find profit in reading but one they cannot read without being induced to buy for themselves.

Along with Guérard's volume it is well to take André Lamande's *Montaigne, Grave and Gay*. Here again we are given a familiar picture of the troublous times of the religious wars and see how difficult was the art of neutrality. The worst passions of ambition, greed, lust, betrayal and political expediency cloaked themselves under the cloak of religious virtue now in the name of the catholic and holy Roman church and now in the name of reform. This life of Montaigne is impartial and dispassionate, showing him both at his worst and his best and above all as charmingly human. This feature of Lamande's writing is perhaps its most valuable characteristic since in giving Montaigne as he was it opens a window into the age in which he lived. Thus it becomes the most valuable of confirmations of the claims set forth by Guérard.

In addition it gives us the heart of the famous *Essays,* for it displays the source from which they sprang and enables one to follow the development of Montaigne's own life and experience in the successive "books" as they appeared.

No one interested in Montaigne and his influence can well forego the pleasure and profit of this volume.

What could furnish a better illustration of the French spirit than Thaddeus' *Voltaire, Genius of Mockery?* The story is so well told that the interest is absorbing from start to finish. And how difficult a character is Voltaire to depict. Though he has been dead a century and a half the world is still partisan about him. Half the world worships him as a transcending genius and the other half continues to call him what he never was, atheist. Few can yet do him justice and too few realize how much of present day tolerance is due to the war he waged often single-handed and alone. Grave defects of character he had, he nursed the vices of his time; but in an age when humanity was largely forgotten he was the uncompromising enemy of slavery, injustice and war.

His apparent hostility to religion was rather against the intolerant institutions which claimed the monopoly of religion and in its name committed the most atrocious crimes. It is well in these days when many raise the cry of tolerance because of their own intolerance to have the story of Voltaire so fascinatingly set before us.

One cannot but feel that at this distance the erudition of Voltaire should have been better gauged than it has been by the author. Certainly there is no need now to employ the extravagant praises of that erudition that characterized his most enthusiastic contemporaries. He was the stormy petrel heralding the revolution, he was a valiant soldier in the cause of freedom, but his brilliancy was scarcely deep and Jean Jacques Rousseau whom he despised has more deeply influenced posterity.

As we write this we take from its shelf a book that was once a portion of Voltaire's library. It is a life of Hobbes, and on the fly-leaf are memoranda in his own hand which show his method of acquiring the quotations that, added to his own inimitable power or repartee, have well-nigh given him the reputation of the world's most brilliant thinker. Quotable passages in the book are indicated on the end pages and thus can be easily gotten at.

The fault of overestimation is, however, an easy one and the reader is more than repaid by the vivacity, skill and historic understanding of the author.

R. T. F.

Science Becomes of Age

THE NATURE OF THE PHYSICAL WORLD, by A. S. Eddington. The Macmillan Company, N. Y. 1928. Pp. 361. $3.75.

It must be generally admitted that, whether or not contemporary physics directly throws its impressive weight in the scales on the side of idealism, at least materialism in all its forms can no longer claim natural science as its high-priest and chief advocate. The extraordinary revolution in cosmology since the last decade of the 19th century is one of the intellectually stupendous events in the history of man. How remote from the snug little cosmos composed of a heap of billiard-ball atoms is the world as portrayed by Einstein, Bohr, Rutherford, Schrödinger, and Born. It is pleasant to learn that much bad metaphysics long recognized by idealism as logically improbable is now known to be empirically impossible. In *The Nature of the Physical World*, by A. S. Eddington, Plumian Professor of Astromony in the University of Cambridge, we have without dispute the most readable and popular important book in theoretical cosmology which has appeared. The author, who is an authority in his field, has corrected in this volume numerous popular mistakes in regard to contemporary physical conceptions, has reviewed the whole field of contemporary physics, has written so that an intelligent layman can understand him, and best of all, in a clarity of conversational style which is thoroughly salted and peppered with downright humor. The book is authoritative, readable and fascinating—what more can the reader ask? A serious constructive piece of explanatory and critical metaphysics, yet as interesting as a dime novel to a schoolboy!

If we ask what significant changes in physical thought has accompanied the new science, besides an utter breakdown of 19th century picture physics with its common sense solidity of substance, and correspondingly, a new and overwhelming appreciation of the complexity of the world, the author has in the introduction a ready answer. In the first place,

> The external world of physics has become a world of shadows. In removing our illusions we have removed the substance, for indeed we have seen that substance is one of the great illusions . . . . The frank realisation that physical science is concerned with a world of shadows is one of the most significant of recent advances.

In the second place, the new science has definitely recognized the impossibility of its standing in the way of richer and deeper interpretations of Reality. Science has come of age. It knows the limitations of its method and it humbly accepts the worth of surmises of a wider environment beyond the touch of its tools of investigation:

> I am convinced that a just appreciation of the physical world as it is understood to-day carries with it a feeling of open-mindedness towards a wider significance transcending scientific measurement, which might have seemed illogical a generation ago.

The earlier chapters of the book give a lucid review of the status of contemporary science from the downfall of classical physics, through the doctrine of relativity, to the new quantum theories. The reader discovers that relativity is merely the beginning of a new and amazing romance of scientific thought. He is introduced to wave theories of matter, Schrödinger's sub-æther of six dimensions, the utter breakdown of Bohr's model of the atom, the breakdown of physical determinism, and the paradoxical "mysticism" (may it be called?) of Heisenberg and Bohr. This latter, which Eddington terms the "principle of indeterminacy," is essentially the extraordinary doctrine that, in substance, "a particle may have position or it may have velocity, but it cannot in any exact sense have both." If this doctrine proves unassailable it apparently means the abandoning of our present categories with respect to subatomic nature.

Those who still insist that the prosaic, poetry-destroying formulæ of physics represent ultimate knowledge about Reality are invited to read chapter 12 on "Pointer Readings." The following are suggestive samples:

> Whenever we state the properties of a body in terms of physical quantities we are imparting knowledge as to the response of various metrical indicators to its presence, *and nothing more*. . . . The Victorian physicist felt that he knew just what he was talking about when he used such terms as *matter* and *atoms*. Atoms were tiny billiard balls, a crisp statement that was supposed to tell you all about their nature in a way which could never be achieved for transcendental things like consciousness, beauty or humor. But we now realize that science has nothing to say as to the intrinsic nature of the atom. The physical atom is, like everything else in physics, a schedule of pointer readings. . . . This soulless nature of the scientific world need not worry those who are persuaded that the main significances of our environment are of a more spiritual character. . . . The cleavage between the scientific and the extra-scientific domain of experience is, I believe, not a cleavage between the concrete and the transcendental but between the metrical and the non-metrical.

The subsequent pages of the book deal directly with the metaphysical problem. In chapter 13 the author opens a direct attack upon both epistemological and metaphysical realism, "I very much doubt," he writes, "if any one of us has the faintest idea of what is meant by the reality or existence of anything but our own Egos."

The author's metaphysical point of view is the Mind Stuff doctrine proposed by Clifford in 1875.

In chapter 14 the author points out that the new quantum theory, in recognizing the principle of indeterminacy, abandons strict causality, and in so doing removes its support of psychological determinism:

> Those who maintain a deterministic theory of mental activity must do so as the outcome of their study of the mind itself and not with the idea that they are thereby making it more conformable with our experimental knowledge of the laws of inorganic nature.

The culminating chapter deals with "Science and mysticism." Science deals with *Symbolic* knowledge. Reality must be sought through *Intimate* knowledge. It is in this category that mysticism is to be placed. Science, religion and art, although using different methods, have a common source, namely, the mind. There is no proof of a God worthy of religion that would satisfy an atheist:

> *Proof* is an idol before whom the pure mathematician tortures

> himself. In physics we are generally content to sacrifice before the lesser shrine of *Plausibility*. . . . I think it is inevitable that these convictions should emphasise a personal aspect of what we are trying to grasp. We have to build the spiritual world out of symbols taken from our own personality, as we build the scientific world out of the metrical symbols of the mathematician. . . . The materialist who is convinced that all phenomena arise from electrons and quanta and the like controlled by mathematical formulæ, must presumably hold the belief that his wife is a rather elaborate differential equation; but he is probably tactful enough not to obtrude this opinion in domestic life. If this kind of scientific dissection is felt to be inadequate and irrelevant in ordinary personal relationships, it is surely out of place in the most personal relationship of all . . . that of the human soul to a divine spirit.

Enough has been presented to suggest the general content and trend of Professor Eddington's thought in this important volume. That during the first four months of this year it had passed through four reprints is itself testimony to its deserved popularity. W. H. L.

The Religious Quest

THE INTERPRETATION OF RELIGION, by JOHN BAILLIE. Charles Scribner's Sons, N. Y. 1928. Pp. 477. $4.00.

THE HUMANITY OF GOD, by JOHN WRIGHT BUCKHAM. Harper and Brothers, N. Y. 1928. Pp. 265. $2.50.

The Interpretation of Religion, by John Baillie, is an excellent book. It is based on very extensive and thorough scholarship in the history of theology, religion and philosophy. It is carefully constructed and well written. No important standpoint is omitted from consideration.

Professor Baillie begins by contending that theology is a special science, the science of religion independent of philosophy. Its function is to understand religion from within. It is no more dependent on metaphysics or philosophy than any other science. He passes successively in critical review upon Speculative Rationalism (the method of the 17th and 18th centuries), the "psychology" and "historical science of religion," offered as substitutes for theology. There follows a consideration of the nature of "Faith." This is followed by a vigorous and penetrating criticism of "Rationalistic Theories" from Deism to Hegel, the "Romanticist theory" (especially in Schleiermacher), "Theological Intuitionism " and the "Religious *A Priori*" in Troeltsch and R. Otto. Then follows the constructive part. Religion is grounded on *Values.* "Religion is a moral trust in reality." Religions are to be classified in terms of the values which they envisage and whose conservation they affirm. Since *values* are found only in persons, religion involves the faith in a Supreme Person. The conception of God has progressed in history and has reached its culmination in Christianity. Jesus Christ is the supreme revelation of God.

The book shows, in addition to the qualities already mentioned, a fine and ardent Christian piety combined with breadth of outlook. My only serious quarrel is with Professor Baillie's conception of philosophy. In the interests of the independence of theology he seems to limit the function of philosophy to making a patchwork quilt out of the results of the various sciences. He refuses to it the task of criticising the assumptions of the various sciences, maintaining that this work is now done by scientists. I should deny that a sharp line is to be drawn between science and philosophy. When Einstein, Whitehead, Eddington and others examine the fundamental assumptions and conclusions of their sciences they are philosophizing, they do not reach their results in laboratories. The synoptic or synthetic work of philosophy cannot be done without criticism. Sciences as such are partial, and philosophy's business is to correct the partiality and one-sidedness of specialized departmental views.

Professor Baillie's own theory of religion is based on certain assumptions; namely, (1) that the faith-attitude supplements or supplies what is lacking in theoretical knowledge; (2) that *valuation* supplies a more adequate key to the meaning of reality than theoretical knowledge; and (3) that the form of value which gives us the key is *moral value*. Now these assumptions imply a philosophy that is not adequately developed in Dr. Baillie's book; and when Dr. Baillie insists that philosophy must *take* from theology, without criticism, its results he is assuming that these "results" are unequivocal and that they do not involve a philosophy. Dr. Baillie's attitude is too close to that of Herrmann, the Ritschlian, who actually said that metaphysics had no relevance to Christian faith and that the latter could even live with materialism. It could and does so live only when *the believer does not think*. Dr. Baillie is too Ritschlian. In his endeavor to vindicate the complete independence of religion, he claims too much. JOSEPH A. LEIGHTON.

The steady growth of humanism and naturalism continues to make inroads upon the confidence of mankind in the fundamental doctrines of Christianity. Ultimately Christianity stands or falls with its central thesis of the grace of God, or, as Professor John Wright Buckham puts it in his recent book, *The Humanity of God*. If the story of the prodigal son symbolizes no truth at the heart of Reality, then Christianity is an outworn myth. The problem of evil in its various forms has always confronted confidence in the truth of Christ's central teaching, and for many the matter became more acute with the 19th century emphasis upon the prodigality of nature and its apparent indifference toward the individual. Can the prodigal son story be reconciled with the prodigality of nature?

Professor Buckham's book is not only unusually timely, but it is also pleasantly straightforward and fearless. The author has his own point of view which he holds with quiet confidence, but he has smothered no facts, and he has not been afraid to face things as they are. The thesis of the book is stated in the introductory chapter:

> The symbolic conception of God as Father offers an interpretation of religious experience and a theory concerning the ultimate meaning of man and the cosmos which is not only tenable but is more rational as well as more productive of human well-being than any other. . . . Personal Theism as symbolized in Divine Fatherhood is as good as any other philosophy of the universe—and better.

It is of course necessary to avoid a childish or stupid anthropomorphism, but the way out is not in the direction of an ineffable abstraction:

> The chief reason why *Father* is the best name for God is that it is a human term deified. Religion is a human-divine experience; it cannot be taken out of the realm of human affections and obligations, hopes and fears, and retain its vitality. . . . Progress in the conception of God—philosophical as well as practical—lies not in advancing beyond the idea of God as Father but rather in advancing more deeply *into* it.

But, it may be asked, is our age not confronted with facts concerning the extent of evil to which the circumscribed age which gave us our doctrine of the Fatherhood of God was entirely oblivious? Superficially this is the case, admits the author,

> And yet, when one stops to consider the situation, was there not as much to challenge belief in God as Father in Jesus' day as in ours? His people, whom he had been taught to regard as very dear to God, were under the yoke of a world-power that gave them no opportunity to fulfill their mission to the world. About him were misery, disease, insanity, hypocrisy, hopelessness, the religion of the leaders of his people hardened into Pharisaic formalism, the people themselves dull, materialistic, sign-seeking. Evidently Jesus had noted well all the apparent contradictions to God's Fatherhood about him . . . the fall of the sparrow, the wanton destruction of the earthquake, the ravages of flood and storm, the hard inhumanity and self-righteousness of the leaders of religion, the confused helplessness of the people, who were 'as sheep having no shepherd.' . . . There is as little to-day as then to arouse and sustain faith in the Fatherhood of God and—as much. Only faith itself can create this confidence. Now, as then, it is only the filial attitude that can find adequate assurance of the Divine Fatherhood. *This attitude Jesus awakens in his followers.*

The claims of pantheism as against the theistic doctrine of a personal and creative God do not seem impressive to the author. Pantheism leads neither to the highest spiritual and moral self-realization, nor are its intellectual claims overwhelming:

> Just as Divine Fatherhood is *the characteristic Christian conception of God religiously*, so it may be said, is its counterpart, Perfect Personality, *the characteristic Christian concept philosophically.* Indeed, the concept of personality is itself largely a Christian product and its reference to God the outcome of Christian thought. . . . With the religious wealth of the idea of Divine Fatherhood,

> illuminated and reinforced by the philosophical conception of Perfect Personality, Christianity is singularly equipped to meet the needs of both heart and mind.

In fact, "the root of a profound metaphysic lay in Christianity itself," which has become explicit in Personalism, "a philosophy which centers consciously and avowedly in *Personality*—human and divine—as the chief of values and the highest of realities." The author makes bold to declare that the conception of Infinite Personality as expressed in the thought of such men as Lotze, Bowne, Howison, Webb, or W. R. Matthews "represents approximately the philosophical counterpart of what Jesus meant when he called God: 'Our Father who art in Heaven.' "

It is impossible to give a complete survey of the book in the limited space available, as it proceeds to attack and conquer the most impressive difficulties facing the doctrine of Divine Fatherhood. Nevertheless the more important problems may be touched. For example, does natural science present a difficulty for the theist? The answer is "No." Science's only dispute is with an ignorant *theologism*, not with Christianity itself. There is nothing in fact to confute Joubert's observation that "One does not understand the earth until he knows heaven." Nor does mysticism comprise a difficulty.

> Mysticism needs the restraint, the normality, the rationality, the human tenderness and strength of the conception of God as Father to keep it from irrationality, emotional excess, and vapid sentimentality.

The highest mysticism can always say "Our Father."

What is to be said of the dark side of Nature? Here the author departs somewhat in the direction of deism, in regarding Nature as a created system with derived powers of self-development, "caused, endowed, given freedom . . . but directed," created by "a purposive, benevolent Intelligence who has infilled it with an inexhaustible developing potency, intelligence, and germinal freedom which enable all the various life-forms to work out, each for itself, its unique self-expression, yet who holds all within the bounds of an all-comprehending unity and a progressive purpose." Thus, "events in the natural world are not the immediate acts of God." (In his argument the author frequently confuses 'immediate' with 'capricious').

What of History and Providence? "If God is in truth the Father of men," the author wisely declares, "it is reasonable to expect that this fact will illumine human history with a light not too dim to be perceptible." It is his belief that "out of all the chaotic maelstrom of events" there are evidences of purposefulness, of moral law, and of progress. And if there are difficulties in the way of belief in Divine Providence, "there are obstacles to disbelief in Providence also." The world as well as human life is unfinished. The larger purposes of God cannot be revealed in the span of human history. Surely personal pleasure cannot be the only aim of Creation:

> Viewed as a recreation center, life offers a sorry and distressing spectacle. Viewed as a school—with a playground attached—the products of which are discipline, character, personality, it presents quite another aspect.

The uniqueness of Christ in proclaiming the Fatherhood of God is not overlooked. The concept has appeared frequently in the history of religion, it is true,

> And yet, the fact remains that the Fatherhood of God is the *distinctive* teaching of but one religion. Nowhere, save in Christianity, does it stand out with clear, calm, unfaltering assurance. . . . No other religion has within itself, or has the power to convey, the conception of God as Father in all the scope of its meaning and application with anything like the convinced and convincing confidence of Christianity.

For this reason Jesus Christ stands pre-eminently and uniquely among the world's teachers:

> One may venture to believe that all the greatest spiritual leaders of the ages—could they be called upon for their attitude toward Christ—would freely and gladly confess him Lord and Master, even as those within Christendom itself have done.

Liberal Christianity, finally, is the end of the universal religious quest:

> That religion which has the largest, most compelling, most redemptive conception of God and man, revealed through humanity's most spiritually vitalizing personality, must be, cannot but be, the interpreter, unifier, and fulfiller of the religions.

This is an important book, popularly written, originally intended as a series of lectures to be delivered in the Orient. If the pressing and ultimate problems of the intellect are to be solved they can receive no better solution than that suggested so clearly and convincingly by Professor Buckham. This book will undoubtedly prove capable of renourishing the flagging faith and vision of many. It contains an impressive power of intellectual and spiritual renewing. W. H. L.

Ethical Theory

ETHICS, by Frank C. Sharp. The Century Company, N. Y. 1928. Pp. 566. $3.50.

THE THEORY OF MORALS, an introduction to Ethical Philosophy, by E. F. Carritt. Oxford University Press, Am. Br., N. Y. 1928. Pp. 144. $1.50.

Ethics, by Professor F. C. Sharp of the University of Wisconsin, the result of long and mature reflection upon problems of moral theory, is a book of unusual importance. It is distinctly not a mere textbook reorganization of traditional material, but comprises rather a fresh and original attack upon ethical theory. The first postulate of this study is the use of the empirical method, which bows to the taste or whim of no "would-be aristocrat of the kingdom of morals." The author has based his conclusions upon a direct study of the workings of the illumined mind of his students in this field at the university, on the assumption that he has here found a fair sample of human nature. The second postulate is his psychological approach; morality is regarded as a psychological, and not a logical or transcendental, fact. At the same time the author repudiates that type of moral skepticism flying under the colors of sociology. Ethics is not mere casuistry, nor is it merely the study of conduct. Its subject matter is comprised of "judgments upon conduct rather than conduct itself." The moral problem is thus a distinct problem of its own arising from a moral function in human nature. This function is not a mere social acquisition; it is found in all ages of human life, and all stages of cultural development. In this he follows Malinowski rather than Durkheim.

The ground and source of morality is found in a unique desire, the desire to do good. This desire, which the author names benevolence, takes two forms, namely, egoism and altruism. These forms differ, however, not in psychological source but merely in object. A similar unique desire is found in malevolence, or the desire to harm. Since this is a self-destructive potency, however, it cannot be accepted as a moral principle. What, then, is good ? The author gives the hedonistic answer: the good is pleasure or happiness, and the value of anything is determined by its power of giving pleasure. The end is therefore the welfare of man, "the most complete attainable welfare of all who are directly or indirectly concerned." The author names his system Universalistic Utilitarianism. In the larger sense, then, the end justifies the means, "But this, seen in its proper light, gives no authorization for playing fast and loose with general rules."

Right and Wrong are predicates of tools relevant to effective satisfaction of desire. Nevertheless there is a distinction between saying a thing is "desired" and saying it is "right." The difference consists in the two attitudes of a narrow and unintelligent view of a desired object and an intelligent and impartial one. "A volition is entitled to the designation *right*," states the writer, "if it is one which, when we have reduced our desires concerning volitions to a consistent system, we desire should govern the actions of all men under the given conditions." The moral judgment is distinct from the æsthetic judgment, with which it is confused by some moralists. The sense of loveliness, of disgust and contempt, as such, are not moral.

This book is a direct contribution to ethical theory. It is closely written, and is hardly suitable as a college text. It will serve, rather, as a treatise for the professional reader and the advanced student. The chapters on "The Moral Ideas of Primitive People," and "The Best Things of Life," will be found of unusual value.

In decided contrast, both in method and conclusions, is *The Theory of Morals*, a very succinct little volume written by E. F. Carritt of University College, Oxford. Applying the dialetical method to the classical types of moral theory, the writer, after acute criticism, rejects hedonism, evolutionary ethics, utilitarianism, perfectionism, the ethics of self-sacrifice and self-realization, and the theory of the common good. In the last analysis, it is held, ethics deals with right and wrong. When is an act right? The author does not seem to give a clear answer, and confesses something astonishing to anyone save an intuitionist, namely, "I have not satisfied myself that there is any quality common to all right acts which make them right. I think that probably most right acts consist in bringing about the distribution of satisfactions which is due in the circumstances. But I attach little importance to this phrase . . . " A right act is the act which it is my obligation to perform, which somewhat evasively leaves the matter suspended in midair like Socrates in the basket. "Of ethical writers," states Professor Carritt, "I think that Kant and Butler come nearest to the truth, though I have also learned much, among the moderns, from Lotze and Martineau." This book is to be commended for its splendid and terse review of ethical theories, and for its repudiation of both a psychological and a sociological foundation for ethics. The author's constructive argument is probably unsatisfying, possibly even to himself. His closing words are: "But my opinions upon these matters have suffered a pretty constant development, and I have no reason to fear that this has ceased even if *vires demittit eundo.*" W. H. L.

The Mind of the East

THE VEDANTA AND MODERN THOUGHT, by DR. W. S. URQUHART. Oxford University Press, Am. Br., N. Y. 1928 Pp. 256. $4.50.

THE ESSENTIALS OF EASTERN PHILOSOPHY, by PRABHU DUTT SHASTRI. The Macmillan Company, San Francisco. 1928. Pp. 104. $1.60.

THE PILGRIMAGE OF BUDDHISM, by JAMES B. PRATT. The Macmillan Company, San Francisco. 1928. Pp. 758. $3.00.

OUR ASIATIC CHRIST, by OSCAR MACMILLAN BUCK. Harper and Brothers, N. Y. 1927. Pp. 181. $1.25.

Two false attitudes towards things Oriental are being avoided by sane scholarship today. On the one extreme is that over-zealous attempt to discredit the East by claiming Western origins of all the best in thought. On the other is an equally fanatic enthusiasm which pronounces everything good that comes from the East, and nothing good which does not. The middle view of sound scholarship recognizes both the merits and the weaknesses of the Oriental mind. The latter is the judicious attitude of Principal Urquhart, of the Scottish Churches College, Calcutta, in his volume *The Vedanta and Modern Thought*, who observes with respect to India:

> India has had, and still has, a most important contribution to make to the thought of the world, and is well qualified to make this contribution by the intensity with which throughout the cen-

> turies she has devoted herself to her philosophical and philosophico-religious task.

The present volume is concerned with tracing the sources of doctrine in pre-Vedantic literature, an exposition of the Vedantic doctrine, and a critical evaluation of its philosophical and religious importance particularly with reference to Christian faith and theism. Attention is given chiefly to the system of Sankara whose devotees comprise seventy-five per cent of the Vedantins. The author is not unmindful that "It can, perhaps, be said with truth that it is in the philosophy of religion that India has made her greatest contribution to the thought of the world." Nor does he fail to appreciate the importance of the Vedantic contribution when he writes that he has "no hesitation in saying that such studies as I have been able to make in Indian philosophy have confirmed me in the faith that God has not left Himself without a witness in the characteristic thought of India, that much of it is unconsciously anticipative of Christian thought." Nevertheless there are unfavorable features, involving such attitudes as passive quietism and subjective complacency. Moreover its general pantheism tends to depreciate personality and to magnify the lower categories. In the last analysis without theism man achieves no complete self-realization. In the words of Gardiner, quoted by the author, "Self-realization must be balanced, not with a pantheistic, but with a transcendent conception of God, for only thus can a man be saved from the worship of self to the worship of God." The undue intellectualism of Hindu thought is similarly defective in fruitfulness: "Within the soul, also, there is an abnormal elevation of the intellect over the other faculties, and this results in an abstract view of the self which empties it of all reality. In practice it leads to a non-evangelical indifference to the religious needs of the common people." The Vedanta gives satisfaction to the intellectual and practical aspects of the human spirit, but it is lacking in the historical and the ethical, and "seems to be too detached from the need of men. It moves in worlds of its own not realized by ordinary humanity." Although one must use great care to avoid exaggeration and omission of important distinctions, the Vedanta is found to sustain a remarkable affinity with much Christian thought and life. Christianity, the writer believes, "seems to continue and make available and valid for all men the central teaching of the Vedanta." He is confident that India will eventually find its quest satisfied in Christ, that in Christ India will "find the goal of her searching, the satisfaction of her desire to realize the nearness of God, a consciousness of which is fundamental in the teaching of the Vedanta." It is nevertheless true that India will continue to contribute to the spiritual wealth of the world, and, in the quoted words of Professor Vasvani of Bombay:

> The West will come to the East to learn its age-long wisdom, in order to develop its own mystical sense, to look upon Nature no longer merely as a field of scientific experiment, but as the sanctuary of the Spirit, to exercise itself in meditation so as to grasp the spirit of idealism and realize the presence of God in social life.

The Essentials of Eastern Philosophy, by Prabhu Dutt Shastri, Senior Professor of Philosophy in Presidency College, Calcutta, comprises two lectures delivered at the philosophical conference held at the University of Toronto in 1922. The writer, one of the recognized authorities on Indian thought, writes in this instance in a popular style in keeping with his audience. Lecture one analyzes and defends Eastern philosophy, and presents a critical analysis of the spirit of the West.

The West, he observes, has seldom treated philosophy as a religious thirst for life, a situation which arises from the separating of theory and practice. Its attitude is peripheral because objective rather than introspective, and has at the same time deified egoism and desire. "We are forced to call this civilization soulless, unspiritual, irreligious, and artificial," is the author's pronouncement. Its method is the result of its passion for clear-cut ideas and scientific precision which has robbed it of that sense of wholeness and wonder and of the ineffable which flowers in mysticism. In contrast to these elements in the spirit of the West is the Hindu attitude. The East achieves the spiritual through that renunciation of the lower which has been a fundamental tenet of all great religions. Recognizing a universal soul in all things, it has taught kindness to all living things. Its doctrine of Karma gives it a sweep of conception which involves the past and future as well as the transient present. Holding fast to the centrality of the subjective, it is oriented in the spiritual. Hindu thought is essentially mystical and non-intellectual, based upon a recognition of the limitations of the intellect: "Throughout Hindu philosophy runs the conviction that the final solution of the ultimate problems will ever remain a mystery to the understanding." Hence the pre-eminent importance of insight and moral apprehension above syllogistic logic. In part II the author gives a very brief but illuminating survey of the great representative systems of Hindu metaphysics.

Those who wish a definitive statement of the origin, history, doctrine, and present status of Buddhism both regarding its relation to Christianity and its opportunity in the East will do well to read *The Pilgrimage of Buddhism* by Professor James Bissett Pratt of Williams College. The volume is the result of over a quarter of a century of interest in the subject and several extensive sojourns in Asia for the studying of both Hinayana and Mahayana Buddhism. The author's purpose, he states, was not to write another treatise on the technical minutiæ of its doctrine. Rather, "I wanted to get a synthetic view of Buddhism, to grasp it as a whole, and also to discover the actual conditions of the religion as it is believed and lived today ." His desire is to inspire in the reader a sense of the tremendous advance and importance of this religion, to give him an "intimate understanding of Buddhism as it is actually *lived* today; "to make Buddhism plausible;" to let the reader "understand a little *how it feels to be* a Buddhist." The narrative and exposition—for the book is as much a narrative as a treatise—follows Buddhism from its source through India, Ceylon and Burma, Siam, Cambodia, China, Korea and Japan. Tibet is purposely omitted, since there Buddhism has become an unrecognizable mongrel. The author has maintained a generous fairmindedness in his analysis of the value of Buddhism. Its merits are numerous. It has always maintained a fundamental and persistent attack upon lust, anger, and worry, and upon egoistic self-centeredness. It has magnified gentleness, harmlessness, and an absence of that vulgar aggressiveness so characteristic of the Westerner. It breeds intellectual tolerance and liberality of thought, and in certain cases pity, represented, for instance, in its doctrine of the celestial pity of the Buddhas who from time to time appear in the world for the illumination of man. And, although in general it is not characterized by an expansive and liberating joyousness, it does create peace of soul. Finally it involves "the universal confidence of all Buddhists in the complete dominance of the universe by spiritual forces." Its defects, however, must be recognized. It lacks a certain joyousness, is generally somewhat cold and repressing to the spontaneities of human nature. Its program through emphasis on the inner life, supports an annoying kind of self-centered "spiritual priggishness," a "sophisticated sort of spiritual selfishness, quite as ugly as the more brutal and naïve form which it has displaced," although it does effectively prevent "the more aggressive and obvious forms of selfishness." Finally, it is tinged with a certain unfortunate passivity. The author considers Southern Buddhism to be in a fairly healthy condition, new life having been inspired in it through the impetus to nationalism following the great war. In China Buddhism is decadent, and the situation is even darker in Korea. In Japan, however, Buddhism is vigorous and hopeful. Shortly Buddhism here will have for the first time a really educated priesthood, and its philosophy is adaptable to Western science and civilization. The reader will be particularly interested in the latter chapters of the volume, in which the author discusses the relation of Buddhism to Christianity, including a careful estimate of the Christian missionary situation in the Orient. Christianity has a service to perform in the East, the author insists, and on the whole it is doing it commendably: "The position of those who deny that these lands are in need of the kind of help which wise and truly Christian missionaries can bring seems to me either based on ignorance, on sentiment, on prejudice, or else to be quite incomprehensible." Nevertheless much damage is being done by zealous fanatics of the more conservative wing of Christianity, through whom Christianity is being discredited by intelligent Orientals as pure superstition. It must be admitted that few missionaries are as educated as they should be (a situation however not peculiar to the East). Nevertheless, as the author points out, "most liberal Christians are in their beliefs very much nearer to liberal Buddhism than they are to the creed of Fundamentalist Christianity."

Professor Pratt concludes that neither Christianity nor Buddhism will be able to destroy the other. The best policy is that of mutual cooperation. Certain types of mind will find Buddhism more satisfying, and at any rate proselyting is not desirable. Too much virgin territory awaits conquest by Christianity and most gains have been made by it from the non-Buddhist elements of the East. In general, however, Christianity is superior to Buddhism in generating joy in place of peace, and in the psychological power uniquely generated by the person of Christ, although he is still widely wrapped in "mythical jewelry." On the other hand Buddhists, who tend toward mysticism and pantheism, find Christian monotheism too stuffy, too cramped, and too neat. Those desiring an authoritative discussion of this important problem should read this book. W. H. L.

The Indian mind has always dwelt on the spiritual and its elucidation, and the material-scientific outlook of Europe and the West has been illumined from time to time by Oriental thought. Now that personality rather than records has become the dominant note in religious and philosophical discussion, the Christian missionary is called upon to defend his Master as the divine personality, satisfying the soul that longs after perfect love or *Ananda.* A book that has recently come out, the work of an American born in India, *Our Asiatic Christ,* takes up this theme. Its author, Oscar MacMillan Buck, is Professor of Missions and Comparative Religion at Drew Theological Seminary, now Drew University. The chapters were originally lectures delivered on the Merrick Foundation at Ohio Wesleyan University.

They treat of "Jesus and Ahimsa," that spirit of gentleness like the dove so appreciated in India, and so marked in the character of Gautama Buddha, making Buddhism a religion of grace. Then of "The Yoga of Jesus," His cup and His baptism, binding us to the larger life of renunciation of self that is spiritual freedom. Then of "Jesus, the Jiwanmukta," who taught us the Father; "lifting up His eyes to Heaven, He said, Father." And lastly of "Jesus and Ananda," spiritual joy or bliss; "Preaching the good tidings. . . . Blessed . . . Blessed . . . Blessed."

The book closes with the prophecy that one day all the peoples of the earth will follow after the Jesus of joy and victory, and the Hindus will shout: *"Mahatma Isa ki jai!* Victory to Mahatma Jesus."

JAMES MAIN DIXON.

Miscellaneous

LA MORALE ET LA LOI DANS LA PHILOSOPHIE ANTIQUE, by AUGUSTE BILL. Librarie Felix Alcon, Paris. 1928. Pp. 301.

The problem of Authority is perennially one which intrigues because of its importance. Its solution, in fact, involves an interpretation of that logic which undergirds the philosophy of law, ethics, sociology, religion, and politics, as well as the more theoretical disciplines of epistemology and metaphysics. The relation of Church and State, of individual reason and conscience to public will, and finally the relation of law to grace—these are sufficient to entice us all because of their importance in human life. The background of European-Christian civilization has been variously charged with the conflicting claims of the Greek and the Hebraic world. The ancient Mediterranean civilizations had already proposed and poured into our Western heritage the competing doctrines of the preëminent places of Divine and Revealed law, Civic law, Natural or Rational law, and the law of individual egoistic Will. The claims and counterclaims of these types of authority remain, and are at the moment in process of re-evaluation in Western civilization.

Professor Bill, of the faculty of Protestant Theology in the University of Strasbourg, proposes in two volumes, of which this is the first and preliminary, to review the question of Authority, both natural, civic, and divine. The present volume is concerned with historical material, in which the philosophy and doctrine of Authority is traced from the earliest thought in Greece down to Cicero. The author has analyzed his material in a lucid fashion. The book is both timely and a genuine piece of historical scholarship. The reader will await eagerly the appearance of the second and culminating volume which will contain the author's constructive argument, under the title of *Le dieu de l'évangile et le dieu de la loi.* W. H. L.

THE GROWTH OF PHILOSOPHIC RADICALISM, by ELIE HALEVY, translated by MARY MORRIS. The Macmillan Company, San Francisco. 1928. Pp. 554. $8.50.

It frequently happens in the realm of scholarship that the highest degree of detachment and of enthusiasm is attained by one remote from the immediate center of interest. Such is to be found in the case of M. Halévy's *La Formation du Radicalisme Philosophique*, which must be recognized as the definitive historical survey of Utilitarianism. Its recent translation by Mary Morris under the title of *The Growth of Philosophic Radicalism* now makes this splendid work available to the reader not sufficiently at home in French to pursue it in the original. The ordinary man takes most of the doctrines common to any age as instinctive or intuitive possessions of human nature; the dramatic play of thought which comprises the history of yesterday has insinuated itself so quietly into the mind of the succeeding age that the source of its beliefs is entirely unnoticed. This is decisively true in the case of the nineteenth century "radicals" who rallied around the program of Utilitarianism, and who have deeply and so silently impressed their thought upon our own. It is hard for us to realize that these radicals of yesterday were merely speaking for what now seem commonplaces—such matters as universal suffrage, universal public instruction, including practical and scientific education, annual parliaments, free trade and unrestricted usury, and prison reform. M. Halévy has thoroughly analyzed the background of the new movement in connection with such names as Adam Smith, Cartwright, Hume, Paley, Hartley, and has indicated the place of French influence in the development of the school. Utilitarianism, of course, centers around the name of Bentham, that prosaic and practical man of action whose fertile mind, always zealous for social reform and the good of humanity, ranged from such matters as his government annuity note scheme to his plan for artificial refrigeration of fruits and vegetables. Bentham, aggressive without limit in matters of philanthropy, it is interesting to note, the man who applied vigorously the pleasure principle to politics as well as to psychology and ethics, was himself essentially a child of Greek cynicism.

The limitations of Utilitarianism are obvious enough. Its false definition of man, its shallow egoism and rationalism, its philistinism regarding things spiritual, its impossible psychology, its naturalistic belief in the sufficiency of the methods of natural science in social and moral life (the venom of which is still diffused through the tissue of contemporary educational and social theory)—these limitations and errors must be admitted by all. Bentham's own abridged statement of his position, which, incidentally, omits his principle of egoism and the natural harmony of interests, he has indicated frankly: "*Association Principle.*—Hartley. The bond of connection between ideas and language: and between ideas and ideas. *Greatest Happiness Principle.*—Priestley. Applied to every branch of morals in detail, by Bentham: a part of the way previously by Helvetius." In spite of its shallowness, nevertheless, like its parental eighteenth century rationalism, Utilitarianism has done yeoman's service to humanity for which grateful acknowledgment is deserving.

M. Halévy has traced the political, economic, social and juridical backgrounds and developments of the radical movement. A significant feature, pointed out by A. D. Lindsay in his short preface to the volume, in addition to the author's rich knowledge of his source material, is his indication of the importance of Utilitarianism in the development of classical economics in England. The book is a splendid piece of scholarship, and happily the translation is well done. W. H. L.

POSSIBLE WORLDS, by J. B. S. HALDANE. Harper and Brothers, N. Y. 1928. Pp.-305. $2.50.

This volume consists of thirty-five short papers, most of which have previously appeared in the journals, on matters all the way from enzymes and food control in insect societies, to the duty of doubt and man's destiny. Professor Haldane is inspired by the conviction, contrary to those scientists who believe that the scientist's sphere is in the laboratory alone, that "the public has a right to know what is going on inside the laboratories, for some of which it pays. And it seems to me vitally important that the scientific point of view should be applied, so far as is possible, to politics and religion." It is frequently the case that a composite book, written by a scientist, proves to be not only headless and tailless, but also, through lack of continuity, missing in sustaining interest for the ordinary reader. The present volume, however, is a happy exception. The writer not only has written upon subjects of interest and about which reliable information is difficult to secure, but he speaks with authority as the preëminent philosophical biologist of

England. In style the author is direct, lucid, and even scintillating; the common reader will never yawn when in the midst of one of the many vividly interesting chapters. The volume is worth reading. Beginning with poetic matters concerning the majesty of cosmic yard-sticks and time clocks, and information concerning why a man and a flea are just the right size, the topics pass to such as Darwinism Today, Vitamins, Enzymes, Oxygen Want, Eugenics and Social Reform. Later essays enter the religious field, such as The Duty of Doubt, Science and Theology as Art Forms, Meroz, and Possible Worlds. In the essay on Kant and Scientific Thought the interesting observation is made concerning Kant that

> the doctrines of both physics and biology have reached stages which are now more easily reconcilable with Kant's metaphysics than with that of any other philosopher. I do not suggest that either a physicist or a biologist need be a Kantian if he adopts any metaphysics: I claim, however, that other metaphysical systems, though they may be preferable on other grounds, are all definitely harder to adapt to the present data of science.

The author pleads for the experimental method in ethics as well as science, and for an enlarged sense of humor which will enable us to recognize the limitations of human thinking. As he rather aptly remarks concerning an over-anthropomorphized cosmos: "If dogs had a religion they would certainly flood their holy places with that 'doggy' smell which is the material basis of their herd instinct." Concerning the revolutionary destruction of the world of common sense by scientists and its philosophical import he observes that such men as Schrödinger, and now Heisenberg, Born and Dirac

> are busily clearing away these vestiges of common sense. In the world of their imagining even the ordinary rules of arithmetic no longer hold good. The attempt to build up a world-view from the end which common sense regards as wrong, is, at any rate, being made, and with very fair success. I suspect that it is of far greater importance for metaphysics than the entire efforts of the philosophers who, from Kant onwards, have attempted to build on the ground cleared by Hume. If it were successful it might lead to philosophical systems in which the real elements in the external world were the secondary qualities of colour, tone, and so forth rather than the primary qualities of the materialist's world.

W. H. L.

WHAT IS THE MIND? by George T. W. Patrick. The Macmillan Company, N. Y. 1929. Pp. 185. $2.50.

In this book Dr. Patrick, the author of many popular works, attempts to determine the direction in which the science of psychology is treading. In a most impartial manner, the author concedes that the attainments of psychology in the past fifty years have been outstanding. This progress is due to the discovery of the objective method in the science of the human mind.

> Nothing probably in the whole history of psychology has done so much to give this science respectable standing in other scientific circles as this method of the behaviorists. It is now welcomed by every school of psychology and universally accepted, though not necessarily to the exclusion of other methods. It is surely innocent of any philosophical implications.

Modern psychology, no doubt, is right in demanding that, before any hypotheses are formed, all available objective data in which the mind manifests itself, or which may determine the activity of it, should be collected and investigated. The study of normal and abnormal human and animal behavior, as well as of the structure of the nervous system at different stages of life and evolution, has presented to psychology a rich store of information.

But, according to Dr. Patrick, it is not quite just to overemphasize with radical behaviorists the objective method and claim that there is no mind. This left wing of behaviorists, no doubt, will in time resume the study of consciousness. Indeed, one should recognize that if mind is behavior it is also something more. Having its root in the Aristotelian doctrine of teleological development, the organicist theory occupies at present the center of scientific attention. Such men as Bergson, with his doctrine of creative evolution, McDougall, with his view of purposive striving, and the school of emergent evolution, all testify that mind or consciousness is the highest product or level of nature.

The author concludes his book with what might be called his confession of faith:

> With the coming of the theory of emergent evolution and the organismic view of nature, there is less interest in materialistic and idealistic philosophies. It seems now less probable that nature is a chance assemblage of material atoms, and still less probable that it is an outer manifestation of some inner psychic stuff. It seems more like an organization with inherent tendencies.

This book, written with an ease and clarity peculiar to the author, may be read with equal profit by the beginner as well as by the advanced student.

R. B. Winn.

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